

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2308.—Vol. XLIX.

LONDON, SATURDAY, NOVEMBER 15, 1879.

PRICE (WITH THE JOURNAL) SIXPENCE.
PER ANNUM, BY POST, £1 4s.

WEIGHING MACHINERY

for all Commercial purposes and graduated to any NATIONAL STANDARD by Patent Machines

HODGSON AND STEAD LIMITED ESTABLISHED 1852.

EGERTON IRON WORKS REGENT ROAD MANCHESTER
Show Rooms 15 New Bailey St SALFORD
Bradford Road DEWSBURY
Uttoxeter New Rd DERBY
NEWPORT MON. and CARDIFF
11 Queen Victoria St LONDON EC

The Barrow Rock Drill

COMPANY

SUPPLY their CELEBRATED ROCK DRILLS, AIR COMPRESSORS, &c., and all NECESSARY APPLIANCES for working the said Drills.

Their DRILLS have most satisfactorily stood the TEST of LONG and CONTINUOUS WORK in the HARDEST KNOWN ROCK in numerous mines in Great Britain and other countries, clearly proving their DURABILITY and POWER.

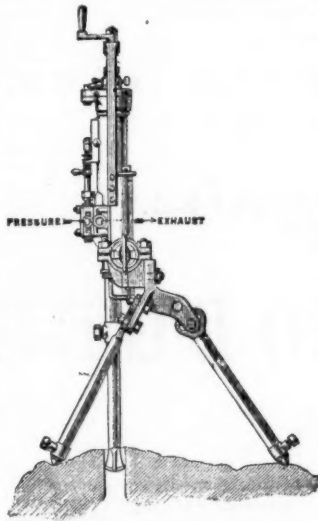
The DRILLS are exceedingly STRONG, LIGHT, SIMPLE, and adapted for ends, stopes, quarries, and the sinking of shafts. They can be worked by any miner.

For PRICES, Particulars and Reports of Successful and Economical Working, apply to—

**LOAM AND SON,
LISKEARD, CORNWALL.**

"Cranston" Rock Drill

IS DRIVING LEVELS 200 LINEAR FEET PER MONTH IN HARD QUARTZ ROCK. "EBERHARDT" TUNNEL AND DRIFT IS NOW DRIVEN IN OVER 5670 LINEAR FEET WITH THESE DRILLS AND COMPRESSORS.



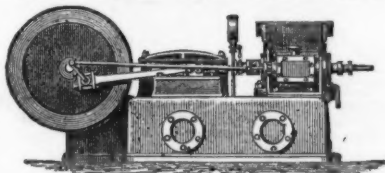
CAN BE SEEN IN DAILY PRACTICAL OPERATION DRILLING 80 FEET OF BLAST HOLES PER DAY IN LIMESTONE ROCK AT ONE-FIFTH THE COST OF HAND LABOUR.

For other particulars and prices, apply to—

**J. G. CRANSTON,
22, Grey-street, Newcastle-on-Tyne.**

"ECLIPSE" ROCK-DRILL AND "RELIANCE" AIR-COMPRESSOR

PRIZE MEDAL,
HIGHEST AWARD.



PARIS EXHIBITION,
1878.

ARE NOW SUPPLIED TO THE ENGLISH, FOREIGN, AND COLONIAL GOVERNMENTS, And are also in use in a number of the LARGEST MINES, RAILWAYS, QUARRIES, AND HARBOUR WORKS IN GREAT BRITAIN AND ABROAD.

FOR ILLUSTRATED CATALOGUE AND PRICES, apply to—
HATHORN & CO., 22, Charing Cross, London, S.W.

JOHN FOWLER & CO.,

Steam Plough Works, Leeds; and 71, Cornhill, London, E.C.

PARIS AWARDS.

**GRAND PRIX
AND
THREE PRIZE MEDALS.**

MANUFACTURERS OF THE

PATENT YORKSHIRE COMPOUND SEMI-PORTABLES (the most economical Stationary Engine in the trade).
HAULING AND WINDING ENGINES, all sizes.
LOCOMOTIVES of various gauges.

AIR COMPRESSORS, VENTILATORS, &c.
CLIP PULLEYS; STEEL WIRE ROPES.
MULTITUBULAR and MARINE BOILERS.

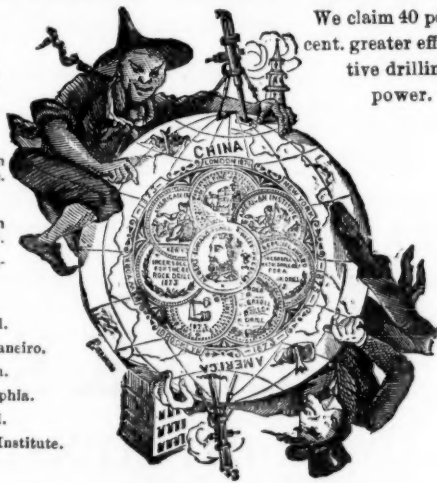
Catalogues, Specifications, or References to Parties using our Machinery can be had on application.

PATENT

"INGERSOLL ROCK DRILL."

MEDAL
AND
HIGHEST
AWARDS.

1872—American Institute.
1873—Ditto.
1874—London International.
1875—Manchester.
1875—Leeds.
1875—Cornwall.
1875—Rio de Janeiro.
1876—Australia.
1876—Philadelphia.
1877—Cornwall.
1877—Mining Institute.
1878—Paris.



We claim 40 per cent. greater effective drilling power.

LE GROS, MAYNE, LEAVER, & CO.,
60, Queen Victoria Street, London, E.C.,
SOLE AGENTS FOR THE

DUSSELDORF

WROUGHT IRON STEAM TUBE WORKS.
TUBES FOR BOILERS, PERKINS'S, and other HOT-WATER SYSTEMS.

For Catalogues of Rock Drills, Air Compressors, Steel or Iron Steam Tubing, Boiler Tubes, Perkins's Tubes, Pneumatic Tubes, and all kinds of Machinery and MINING PLANT, apply to—
60, QUEEN VICTORIA STREET, E.C.

JOSEPH FIRTH AND SONS' New Patent Brick-making Machine

Embraces the following advantages—viz.:

Simplicity, strength, and durability. Compactness and excellence of mechanical arrangements, large producing capabilities, moderate cost.
It will make 12,000 to 14,000 plastic pressed bricks per day, hard enough to go direct to the kiln without drying.

WEBSTER HILL, DEWSBURY.

[See Illustrated Advertisement every alternate week.]

"Kainotomon" Rock Drill

SELECTED BY THE

BRITISH, PRUSSIAN, & SAXON GOVERNMENTS.



**SUPERIOR AIR COMPRESSORS.
T. A. WARRINGTON,
30, King-street, Cheapside, London.**

For Excellence
and Practical Success
of Engines.



Represented by
Model exhibited by
this Firm.

**HARVEY AND CO.,
ENGINEERS AND GENERAL MERCHANTS,
HAYLE, CORNWALL,
LONDON OFFICE.—186, GRESHAM HOUSE, E.C.**

MANUFACTURERS OF
PUMPING and other LAND ENGINES and MARINE STEAM ENGINES of the largest and most approved kinds in use, SUGAR MACHINERY, MILLWORK, MINING MACHINERY, and MACHINERY IN GENERAL. SHIPBUILDERS IN WOOD AND IRON.

MANUFACTURERS OF
HUSBAND'S PATENT PNEUMATIC STAMPS.

SECOND-HAND MINING MACHINERY FOR SALE,
IN GOOD CONDITION, AT MODERATE PRICES—viz.,

PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES; STEAM CAPSTANS; ORE CRUSHERS; BOILERS and PITWORK of various sizes and descriptions; and all kinds of MATERIALS required for MINING PURPOSES.

ROBEY & CO., ENGINEERS, LINCOLN.

No Expensive
Buildings, or
High Chimney
required.



AWARDED GOLD MEDAL,
PARIS EXHIBITION, 1878.

Engines up to
200 effective
horse-power
always in
progress.



SOLE MANUFACTURERS OF The Patent Improved Robey Mining Engine.

Some of the advantages of this Engine are—

SMALL FIRST COST; SAVING OF TIME AND EXPENSE IN FIXING; EASE,
SAFETY, AND ECONOMY IN WORKING; GREAT SAVING IN FUEL.

LIKEWISE, SOLE MANUFACTURERS OF

Improved Vertical Steam Engines and Patent Boilers combined.

The Illustrations show one of Robey and Co.'s Improved Vertical Engines. These Engines can be supplied with R. and Co.'s New Patent Boiler, which has, among others, the following advantages over all Vertical Boilers yet introduced:—

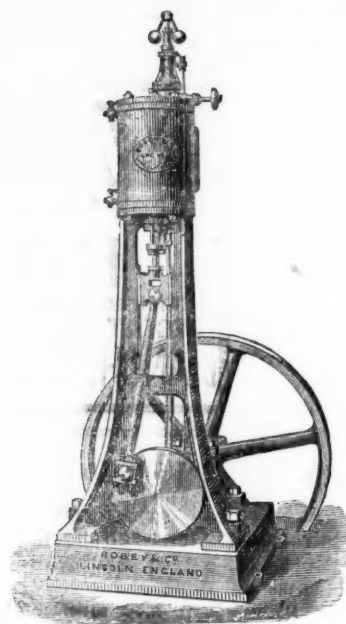
PERFECT CIRCULATION OF THE WATER; SEPARATION OF THE SEDIMENT;
GREAT DURABILITY; GREAT ECONOMY IN FUEL.

For photographs, prices, and full particulars, apply to the

SOLE MANUFACTURERS,

ROBEY AND CO., Lincoln, England.

References can be given to upwards of 5600 ENGINES of all sizes, from 2 to 50-horse power.



MECHANICAL VENTILATION OF MINES.

THE UNION ENGINEERING COMPANY (C. SCHIELE AND CO.) undertake the Construction and Erection of their Colliery Ventilation Fans, of all sizes up to the largest required quantities of air. The leading features of their system are now generally known. Some of the specialities are: The absence of necessity for costly erections in masonry and brickwork; the small space required for the Machines, and the moderate first cost of the whole.

As the Fans are in a great measure self-contained, the necessary seats and connection with Pit are of a simple and inexpensive character. They can be arranged to be placed below ground when required, and also to work on

Drawing Shafts. Certain sizes are often used to assist in Furnaces, with good effect.

[Estimates and further information will be prepared on receipt of the necessary particulars.]

FOR SINKING PURPOSES, and also for places where small quantities of air are needed for Ventilating purposes, a Special Fan is made, in various sizes, with small engine combined, complete, arranged for both forcing and exhausting air.

NOISELESS BLOWING FANS, for Smithy Fires, and other purposes.

TURBINE WATER-WHEELS, specially designed and adapted for use in Coal Mines, for high falls of water, for the purpose of developing water power, where it is available, for use in hauling, pumping, and other works.

The Firm, having had an experience of nearly twenty-five years exclusively in the above Special Departments of Engineering, are prepared to advise on any matter affecting the application of Fans or Water Power in Collieries or elsewhere.

COAL-CUTTING MACHINERY, WINDING, HAULING, AND OTHER DESCRIPTIONS OF STEAM-ENGINES.

THE UNION ENGINEERING COMPANY (C. SCHIELE & CO.),

PNEUMATIC AND HYDRAULIC ENGINEERS

(SOLE PROPRIETORS AND MAKERS OF SCHIELE'S LATEST PATENTS),

2 CLARENCE BUILDINGS, BOOTH STREET, MANCHESTER.

HUDSWELL, CLARKE, & RODGERS,

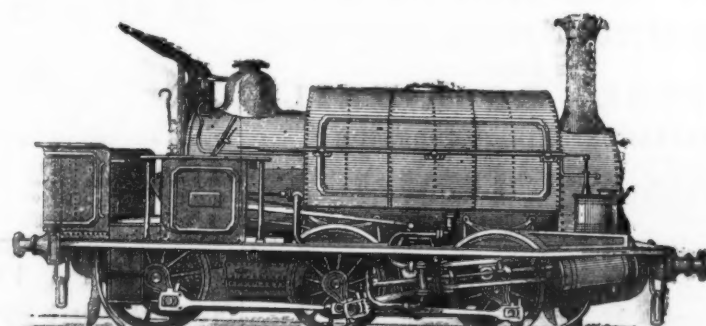
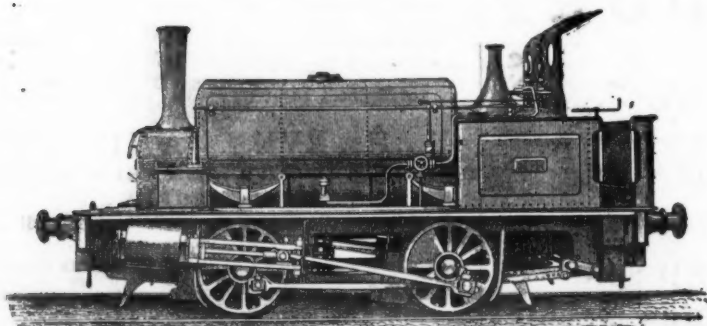
RAILWAY FOUNDRY, HUNSLET, LEEDS,

ARE NOW MAKING A GREATLY IMPROVED
CLASS OF

TANK LOCOMOTIVE,

EITHER ON FOUR WHEELS OR SIX, OF
VARIOUS GAUGES,

IN WHICH EXTRA STRENGTH AND DURABILITY ARE COMBINED WITH SIMPLICITY AND ECONOMY IN REPAIRS.



FIRE BOXES—Copper. TUBES—Brass. TYRES—Steel. AXLES—Steel. BOILER PLATES AND MACHINERY of the best Yorkshire Iron.
NEW LOCOMOTIVES, with Cylinders 8 in., 10 in., and 13 in. diameter, always in stock or in progress. SECOND-HAND LOCOMOTIVES, of various sizes, FOR SALE OR HIRE.
PRICES AND SPECIFICATIONS ON APPLICATION

Original Correspondence.

THE FOREST OF WYRE COAL FIELD—IMPORTANT DISCOVERY.

The Forest of Wyre Coal Field, as determined by its superficially exposed area, occupies an irregularly elongated tract of country, which in reality forms part of and is directly connected with the far better known, but less extensive, coal field of Shropshire. Taking Bridgenorth as its northern and the Walgrove Hills as its southern extremities (in both of which it tapers to a mere point), it is about 18 miles in length, and by a line drawn east and west from Upper Arley 7 miles in extreme width. Its western boundary line consists of Old Red Sandstone; its eastern margin is made up partly of rocks of the same formation, and, especially to the south-east, partly by different members of New Red Sandstone rocks, but north of a line running east and west from Upper Arley, the marginal strata are exclusively of Permian age. Geologically, therefore, the western and southern parts of the field appear to have been placed within a hollowed basin of Old Red Sandstone, and is thus in its relation to and comparison with other English coal fields of peculiar interest, inasmuch as in no other instance do strata of the same geological horizon lie over so large a tract of country directly on rocks of this description, or without the intervention of millstone grits and carboniferous limestone. There is also the further peculiarity in the fact that at least over some, but undefined, portion of this area the measures of which it is composed belong exclusively to the upper division of the coal-bearing series—a division which, although in its normal condition of great vertical thickness and persistency, seldom contains, in addition to its ironstones and brick clays, more than two or three seams of coal of workable thickness and quality.

Now, the evidence upon which the knowledge of these latter conditions of the field is based has been obtained principally from explorations carried on by the process of mining at different points of the country in question, but, till within a recent date, these explorations have been confined to the western and southern margins of the field, and along the lines or within a moderate distance of the outcrop of the seams of coal hitherto worked. As a matter of course, therefore, that evidence and the conclusions arrived at from it apply only to the limited area described, and the remainder of the field may or may not be found to exist in a corresponding stratigraphical condition. It may, however, be pointed out that there is in the occurrence of the millstone grits and carboniferous limestones, which fringe and underlie the neighbouring Cleehill coal field, in the geological position and character of the coal seams and associated deposits of that field sufficient evidence to warrant the conclusion that the fundamental strata, accompanied by the lower divisions of coal measures which contain the coal seams of commerce, as surely and distinctly assume their proper position beneath these newer or upper measures, somewhere or other in the Forest of Wyre coal field, as that these same upper measures become perfect in their ascending order by the gradual introduction of strata, which naturally pass up to and become incorporated with the oncoming and conformable so-called Permian. Further, and in all reason, it may be added that not only is this so over a large portion of the north-eastern area of the admitted coal field, but also over that larger tract of country which comes between, but by which it is now divided superficially from, the great and valuable coal field of South Staffordshire.

The existence of the Forest of Wyre coal field has, it is hardly necessary to say, long been known, but, as is the case with all others of the country, it shows that mining operations or "delving" for coal originally commenced at and were long confined to the outcrop of the coal seams along their different margins. The coal seams, however, of these localities are not only limited in number, but inferior in quality, and, with the exception of an associated group of coals, called the "Main Coals," of a sulphureous nature. The best of the workable portion of the Main Coal, which has been worked at Harecourt, Arley, Billingsley, and a few other places, varies from 4 to 6 ft. in thickness, and is the only seam hitherto gotten which is worth the trouble and expense of working on an enlarged scale. The sulphur coals are still worked along their lines of outcrop at Mable, Bayton, Common, and elsewhere for purely local purposes, and in limited quantities.

The measures in which these seams occur consist of the ordinary shales, binds, and rocks of the formation, but they are accompanied by sandstones, breccias, conglomerates, and marls of great variety, both as regards colour and composition. The strata generally lie at an inclination of from 5° to 10° to the east, and are but slightly disturbed by faults. They are also but lightly charged with water, and what there is is generally confined to within 50 yards of the surface. The Main Coal series is not only nearly free from, but it is not known to contain explosive gas.

It appears that about two years ago a few gentlemen combined privately, but under the title of the Highley Mining Company (Limited), for the purpose of acquiring a lease of a mining property at Highley, situated about midway between Bewdley and Bridgenorth, upon which a few months previously mining operations had been commenced by a private firm. The original intention appears to have been to work the seam of coal which had some 50 years ago been worked close to the Severn, under the name of the Stanley Coal. This coal is said to have been a good coal, and no doubt it was, but the name is a local one, and under any circumstances the original project was not carried out. Therefore, in January, 1878, the new proprietors commenced operations for the purpose of thoroughly proving the estate, and the following is the immediate result.

Near the village of Highley, on the western flank of the hill on which it stands, is a brickyard, with abundant deposits of serviceable clay, which has been largely used in the manufacture of bricks applied to the erection of the permanent plant. There is an engine and machinery here, with sheds and three kilns, an office and other buildings, and a reservoir for supplying the whole of the engines on the ground. Two 7-ft. shafts have been sunk to the upper, or Sulphur, coal, 19 and 20 yards respectively, the object being to ascertain by proving the position and character of known coal seams here the best site for the permanent sinkings, and in this they were practically successful.

The site chosen for these main sinkings is to the east of the trial sinkings, or so much nearer the railway, being within 300 yards of the Highley Station and 500 yards of the river. The situation not only overlooks the Severn Valley, but commands an extensive view of the surrounding country. The permanent plant is of the usual description, strong and thoroughly good, and in every way adapted for the requirements of a very large output of coal. There are two 9-ft. shafts—No. 1 carried down through the main coal 305 yards, and No. 2 at present 20 yards only.

From the bottom of No. 1 shaft roads—6 ft. 6 in. high by 7 ft. wide—have been driven north and south, a total distance of nearly 200 yards, in which only one small downthrow fault in the north level has been met with. The coal lies at an inclination of about 2½ in. per yard 70° east of north. The roof of the coal is strong dark binds, and the floor fire-clay rock. The coal itself is a sound bright semi-bituminous coal. It burns freely, with a good heat, leaving a low percentage of reddish-brown ash, and in its general composition and character bears the strongest possible resemblance to the well-known Brooch coal of South Staffordshire—therefore a thoroughly good and serviceable coal for all purposes. It contains no gas nor water to cause inconvenience, and when in proper work will yield from 80 to 90 per cent. of large coal. The Main coal, so far as it has been proved here, is 7 ft. 6 in. thick, with a thin parting, the best part of the seam being about 4 ft. thick, and lying at the bottom. At Billingsley, situated a little over two miles to the north-west, the main coal series contains three workable coals, the first occurring at 155 yards from the surface.

The Billingsley and Highley coals appear to be identical, and there is in all probability the same tendency on the part of the strata which come between the different coal seams of this field, as in many others, to thicken on the line of dip. In this case, and in regard to which the evidence is fairly conclusive, it may be safely held that explorations carried down from the bottom of the shaft would result in adding to the number of workable coal seams, and consequently

to the general resources and value of the property. Practically, however, the satisfactory result has been obtained of the existence of an excellent coal, which can be most economically worked, and for which the immediate district offers a ready and profitable market. Direct access with the River Severn, the Severn Valley Railway, and good roads communicating with the country round, give the necessary outlets, and there are the large and populous towns of Bridgenorth on the one side, and Bewdley, with many others, on the other, where an open and increasing market is available for the consumption of enormous quantities of coal. These districts are now supplied principally from Cannock Chase, at prices considerably augmented by the cost of carriage.

Geologically and commercially, therefore, the Highley sinkings are of considerable importance, inasmuch as in the one case they prove the extension of a series of workable coals further to the north-east than had before been determined; and in the other they will be the means of placing both on the local and general markets a large supply of fuel adapted in every respect both for manufacturing and household purposes.

The proprietors have, therefore, by their spirited undertaking earned the support and gratitude of the inhabitants of a large tract of country, and they deserve the reward which cannot but otherwise than await them.

WILLIAM MOLYNEUX, F.G.S.

Branton Lodge, Burton-on-Trent, Nov. 10.

COAL BRIQUETTES.

SIR,—Will you kindly find space for the following lines, which will explain some of the misapprehension on the above subject in connection with the briquette-making plant we recently supplied for the Marquis of Londonderry's Collieries.

Your Welsh correspondents are quite correct in saying that the manufacture of Patent Fuel—coal agglomerated with pitch—has been carried on in their district for years. The use of pitch, however, has always been open to the following serious objections—heavy cost of the necessary plant to begin with; cost of the process, from the use of the pitch; extra amount of smoke from the fuel when made, on account of the presence of the pitch, &c.

With the Londonderry plant, which is similar to those we have had working on the Continent for some time with highly satisfactory results, we dispense with the use of the pitch altogether. We avoid the increased smoke, the plant costs little more than half the pitch fuel plant, the cost of the process is barely a quarter as much. Hundreds of colliery owners in this country would have only been too glad to adopt the pitch process had there been any profit to be made out of it—as it is the cost of plant and process kills it. As to the probability of briquettes made by our process finding a market, they sell readily enough on the Continent; and, if so, there certainly seems no valid reason why they should not do so in this country, particularly when we remember the superior quality of English coal. At any rate, so thinks the practical and energetic manager for his lordship, as well as many others.

The term "briquette," which is a French word, meaning really small brick or lump, from "brique" (a brick), can hardly be claimed by your Welsh correspondents, seeing that the patent fuel they speak of is usually made in blocks weighing 10 lbs. to 20 lbs. each. With our machines we can make briquettes of 2 lbs. each at the rate of 36,000 per day of 10 hours, the cost of making not exceeding 7d. per ton.

You were quite correct in stating that the manufacture of briquettes is a growing and important industry on the Continent, also that it was about to be introduced in this country at the collieries of the Marquis of Londonderry.

Leeds, Nov. 11.

YEADON AND CO., Colliery Engineers.

PNEUMATIC MINERAL DRESSING.

SIR,—I read with much pleasure the article on the new pneumatic dressing machinery in the Journal of Oct. 25, and do not doubt that as soon as the invention becomes generally known it will be largely adopted. I well recollect the admirable machine shown in operation by Mr. Berard in the French machinery department of the International Exhibition of 1862, and I also know the construction of the original Krom separator. I am, therefore, the more surprised that nothing has been done to adopt in needy mines especially what certainly appears to be likely to lead to great economy. I think the principle of Mr. Berard's machine was excellent, and the only difficulty which remained to be got over was the regulation of the force of the blast to suit the exact character of the ore falling before it, so that the several qualities should each be blown into its proper receptacle. This ought not to have been an insurmountable obstacle, as it is very easy to make an entire parcel moderately uniform, and then the worst difficulty would be that a hundredweight or so used in regulating the blast would have to be put through the machine again.

But where I think the air separator would be most advantageous is where neither water-power nor cheap fuel are readily obtainable. In such cases wind-power could be used for crushing or stamping, and with similar power applied to pneumatic dressing machinery clean ore could be sent to market from mines which, although containing rich ore, are now lying idle. What those interested in the machinery in question should do is to make the invention widely known by advertising in every newspaper circulating among miners, showing first cost, and cost of repairs, and more particularly stating where the separators can be seen at work.

Great Winchester-street, Nov. 10.

PNEUMATIC MINERAL DRESSING

SIR,—Observing that the question of substituting air for water in the dressing of minerals has again been raised in the *Mining Journal* I may be permitted to make a few remarks upon the general advantages and disadvantages of that system. Theoretically nothing could be better than pneumatic dressing, but practically all attempts hitherto made to introduce it have proved to be failures, because pneumatic dressing cannot be carried on economically. If air be used instead of water the inconvenience of droughts is avoided, and we never get legal actions for contaminating water-courses. Some of the pneumatic apparatus is better than others no doubt; but all do their work fairly well, and when the higher cost of purchasing and keeping in order the better machines is taken into account it may be said that the commercial values of all the machines is about the same. But air does not act in the same way as water when used for mineral dressing, and the difference is all in favour of water. To make what I mean clear we will suppose we have an ore of lead to dress, which is about as easy as any I know, as the quartz will be about 2½ to 3 specific gravity, and the galena about 7½ specific gravity, so that it is almost like separating sawdust from pebbles. Well, even dressing lead ore with air does not pay, and I will tell you why. It is because the specific gravity of air is too different from that of the materials to be dressed, and in the particular ore I have named we should find that instead of substituting air for water it would be better, suppose it were practicable, to replace the water by a fluid of 1½ or 2 specific gravity.

Suppose we get 14 lbs. of ore—mixed quartz and galena—on the sieve, all properly sized and in the best condition for dressing. Then, look at the difference between water dressing and air dressing. We shall have the equivalents of the old Saxon jig anyhow, and the whole mass of ore must be lifted bodily (say) 100 times a minute. When the lift is made in water the difference in the speed of fall of the quartz and galena is much greater than when the lift is in air, and also in water the quartz floats a little out of the way to let the galena fall. In air, on the contrary, all support is withdrawn the instant the back stroke commences, and, consequently, the quartz is knocked down into its old position by the galena, so that the separation is only very slow. Air has another disadvantage for dressing mineral, which is that it must be supplied at high-pressure; the pressure of 1½ to 2½ ozs. on the square inch being quite useless for dressing purposes. The pressure per square inch must be in excess of the weight of a cubic inch of galena, because it is cubes or their equivalents, and not superficies of galena, which have to be lifted, and this pressure must be calculated after the air has passed the sieve. When water is used, the density being constant, the sup-

port continues during the back stroke of the water piston or of the sieve; but, in the case of air, the instant the pressure is withdrawn the support ceases, with the effect already described; so that what is done with 30 lifts or pulsations in water requires about 100 lifts or pulsations in air.

As to producing what I may call the contact between the ore and the separating fluid—air or water—water has also the advantage, because there is no waste of power with it. The pulsation must, of course, be produced either by lifting the sieve or by moving the fluid. Take the first case. If we move the sieve we must make twice the number of lifts (in practice it is really thrice the number) with air, which means twice the consumption of power as compared with water dressing. Take the second case. With water we have only to move the body of fluid, which can be accurately balanced, so that the whole power applied is transferred to the ore to be lifted. But with air it is not so, although it is a curious fact, which I have proved by experiment, that when the pulsations are rapid the air is much less compressible than is generally supposed; during the first instant of the application of force to air confined in a tube there seems to be a general rush forward without compression, the compression commencing at that end of the tube which is farthest from the applied force. This is so far in favour of the air, but it is not enough, as it applies only to the first stroke, and when the strokes are in rapid succession there is a fighting of air currents in the tube which wastes more power than it saves, so that on the whole more than double the force must be applied when air is used in order to do a given amount of work. Air dressing can, therefore, never be desirable, since if steam-power be used the cost would be enormous, and if water-power be available none of the difficulties which air dressing is supposed to remove can have any existence.

MINER.

Callington, Nov. 11.

WATER-POWER FOR MINING PURPOSES.

SIR,—The great economy effected by the application of water-power to drive the machinery connected with mining operations needs no comment. The large outlays that have been made in some mining districts in collecting water, construction of reservoirs, water courses, &c., go to show fully the importance of its use. While, however, its value as an economiser appears to be fully appreciated in some mining localities, in others it seems to be to a great extent disregarded. How to account for this is hard to state, since all are ready to assent to its superior economy compared with steam-power. The erection of the needful machinery to apply water-power is generally less costly than that to apply steam-power, to say nothing of the difference of current working costs. The objection in many instances to the use of the available water is that the supply is irregular and the working of the machinery is liable to be interrupted. This is quite true. But whether it is prudent to allow powerful streams of water to run unused nine months in the year because during the other three its quantity is so far diminished as to fall below requirements in point of force is in many cases very questionable. It may happen that serious obstacles may be in the way of husbanding for the dry months in particular cases, but in a large percentage of cases a moderate outlay would enable the difficulty to be overcome, and a regular supply kept up throughout the whole year, to the great advantage of the mines.

The foregoing remarks refer more particularly to rivers and streams the relative positions of which as regards altitude are above the points of operations. The following refer to them below these points. The general application of waterfalls to drive machinery range from the works upwards, and the falls that may happen to take place below the machinery are generally treated as useless. The mode of extracting and transmitting the power from waterfalls below the points of operations is attended with greater difficulty than those above, but notwithstanding there are no practical difficulties connected which cannot be overcome. Long rods may be worked with good effect in many places, the nature of the ground regulating to a great extent what kinds of rods they shall be—wood, iron, or water. Wood or iron would command reasonable distances where the ground and other circumstances would admit. In cases where, however, there might be obstacles of a formidable nature either by the inaccessible nature of the ground, or where the ground is ornamental, and it would be undesirable that the appearance of any kind of machinery should be absent, then the water-rod might be applied with good effects. The construction of the water-rod is simply this—a plain water-pipe filled with water, which could be placed along the surface, but covered; or it might be conveyed through any of the underground workings to the point in or on the mines where wanted. A reciprocating motion could be given to the water in the pipe or otherwise, according to the nature of the machine or machines that were worked by it. The distance or length of the water-rod would be of little consequence. The amount of elevation of one end of the rod over the other under certain circumstances, however, would depend on the manner how it were applied. (This part of the subject I must omit for the present, as well as the transmission of the power of the waterfalls in the shape of compressed air, now so generally recognised.)

London, Nov. 13.

GEORGE RICKARD.

ON COMPRESSED AIR.

SIR,—Reference has been made in a former communication to the small percentage of useful effect supposed to be obtained when compressed air is adopted as a motive power; the question is at present being investigated by various engineers and men of science, so that in course of time we may be able with more precision to account for the great loss of power usually supposed to accrue from the working of air compressors; this loss it is thought is due in a large degree to frictional resistance and to leakage. First, there is the friction of the engine itself and the compressing cylinder to overcome, as well as that of the air passed through the inlet and outlet valves, also the compression of the air from atmospheric pressure to the pressure obtained in the receiver by the action of the compressor; and lastly there is the resistance to the delivery of air through the pipes, depending upon their great or small capacity for the supply and working of the engines or other motors driven by the air so compressed.

In the first place a well-designed engine is absolutely required, to work with variable expansion, and afford economy in working. The effect of the expansion of steam in the cylinder is to increase greatly the amount of work done with a certain amount of steam or fuel. Suppose the effect with no expansion to be 1, with double expansion it would be about 1.5, and with fourfold expansion the effect would be about double that in the first case; in the last case one-half the weight of fuel will do the same work as compared with that where no expansion is used.

Horizontal engines are usually applied for compressing air. In very many instances the compressor is placed in the same line with the steam cylinder. The principal objection to this arrangement is that, as the highest power is required for the compressor at the end of the stroke, the force in the steam cylinder in the same position is exactly contrary when the steam is used expansively. This defect may be obviated on the system devised by Mr. D. P. Morison, by which the engine and compressor may be placed side by side, a crank shaft being added, and the cranks fixed at right angles to each other. A fly-wheel is equally requisite to give a steady and continuous motion to the compressor, whether a pair of engines and compressors are adopted, or only one, but in the latter case it is an absolute necessity.

Another most important matter is the cooling of the air in the act of compression. Various methods have been resorted to to accomplish this purpose, that most common being to keep the compressor immersed in cold water, or else to jacket the cylinder at sides and ends, through which a stream of cold water should constantly flow, but as air is a bad conductor of heat it is obvious that these methods have a very limited effect, that part of the air in contact with the cylinder only being in any way sensibly cooled, and, therefore, practically as a means of cooling the air these methods may almost be dispensed with.

The mode of cooling the air adopted by Sommeiller in the Mont Cenis Tunnel was by keeping the cylinder filled with water, in which the piston worked, the air being compressed in a vertical chamber at each end of the cylinder; by this means it was kept cool, but the motion of the piston was necessarily slow—about eight revolutions per minute, the air being compressed to eight atmospheres.

Another and more effectual method of cooling is by a jet of water

in the form of spray, which brings the cold water into contact with the body of the air in the compressor. The water or spray is forced into the cylinder with sufficient pressure by a pump.

It is generally found that with high pressures the loss by the heating of the air is greatest; the higher the pressure the greater the percentage of loss of power sustained. It is, therefore, advisable to work with low pressures as far as possible. The same advantages derived from using steam expansively in the cylinder will also result from using air expansively in the engines actuated by compressed air, whether as hauling engines underground, or engines for pumping water in the mine or at the bottom of the pit.

Experiments have been made which show that with a pressure of three atmospheres, the air being cooled in the compressor to a temperature little above the initial, and used expansively in the air-engines, the loss of power at the compressor and air-engine was about one-seventh; but where neither cooling the air in the compressor nor its expansion was adopted the loss amounted to nearly one-half of the power indicated in the compressor. With a pressure of five atmospheres, the air being kept cool in the compressor, and used expansively, the loss was one-fifth, but where these expedients were not adopted the loss was about six-tenths. Under a pressure of eight atmospheres, when cooling and expansion were adopted, the loss was one-fourth, but without these the loss was about seven-tenths of the prime power.

The subject being one daily increasing in interest, it is the intention of the writer to supplement these preliminary remarks by other data collected in detail bearing upon the question. M. E.

COATING THE INTERIOR OF BOILERS.

SIR.—The importance of technical education has frequently been pointed out in the *Mining Journal*, but lest you should require some further confirmation of the fact I may refer you to the extraordinary invention of Messrs. Jacobs and Hewitson, of the Bute Docks here, which practically is a proposition to generate steam in an india-rubber boiler lined with Portland cement. The cement they apply to the interior of boilers over the joints, which it renders perfectly watertight, even if previously defective. Over this cement they lay Portland cement, which serves as a temporary covering. The boiler is put to work, and the heat of the water causes the gradual vulcanisation of the india-rubber cement, thus producing a permanent coating or covering to the joint or part, which covering being elastic is not liable to become displaced by the expansion and contraction of the boiler during heating and cooling. The use of fibrous material may be in some cases dispensed with. Now, the idea of stopping a leaky boiler with india-rubber, or even with Portland cement, is so novel that Messrs. Jacobs and Hewitson are not likely to be charged with plagiarism, but whether such an invention is calculated to diminish the loss of life from explosion I should prefer the engineer of one of the Manchester boiler inspection companies to that of any inventor. I should, however, like them to explain how they prevent the india-rubber softening and becoming leaky before it gets vulcanised. H. J. F. Cardiff, Nov. 10.

AN ARCTIC RAILWAY PROJECT, FORSOOTH!

SIR.—In the *Journal* of Oct. 25 I showed the deplorable financial position of the Swedish railways having seats of administration in London. Permit me, now, to notice the financially engulfed state of an important line with direction in Sweden, for which information I am indebted to the courtesy of the London agents, Messrs. Dent, Palmer, and Co. In May, 1878, Mr. E. H. Palmer, Governor of the Bank of England, presiding over a numerous meeting of the debenture holders and creditors of the company, stated that a large amount had been advanced to the company on the condition of repayment in the course of ten years, which condition had been found impossible to fulfil, both interest and capital remaining unpaid. The debenture holders were urged to accept a moiety of the interest for a period of five years in bonds, but I do not gather from the general balance-sheet that any portion of either the said half or the accrued interest has been paid. As compared with a Lapland railway beyond the Arctic circle, this southern line in a populous district has a considerable passenger traffic (mails), as well as traversing a large wood and iron district, the extent of the line being 92½ English miles.

I find it quite unnecessary to infringe further on your valuable space than by stating that the last Board of Trade Returns for the United Kingdom railway receipts for passengers and goods traffic is 131,76d. per train mile—those of this line, including a comparatively large amount for mails, 45d., less 37d., or 84½ per cent. working expenses. Now, I ask any man if, as I have shown from the accounts of the several railway companies, they are in so disastrous a position what can be the goal the promoters of an Arctic surface railway propose to attain. My letter of Nov. 1 showed the utter futility of the avowed object—the “utilising of the deposit of the Gellivare iron ore,” to which document I refer the New Gellivare Company's accounts, exhibiting the awful loss of 7½ a ton on their iron, loss on their wood, loss on their Arctic farms, loss on their steamers. Do Messrs. Cook, the enterprising excursionist undertakers, think of extending their operations to convey Midsummer solar observers, and are the calculations of the promoters based upon deriving sufficient income from this source. Do they imagine that with a region barren of population—snow generally falling in September, and not disappearing until the end of June—people will be induced to travel, approaching 2000 miles in winter, to face a temperature of 28° Reaumur, which I have experienced in Lapland, for the sake of driving with reindeer? Do the promoters really imagine the Government will make any exceptional concessions to them for felling timber in the actual impoverished position of the wood trade of the country?

Just hear what a director of the New Gellivare Company stated at the general meeting of shareholders on July 31. This party is, I am authoritatively informed, the delegate of the chief creditor of the company. This gentleman stated “the immediate future of the company really depended entirely upon the course of prices, and if there was a fair improvement in the price of wood—say, 2½ per cent.—the company would be able to pay its interest, and possibly a small dividend on the shares.” Now, 2½ is equal, as per their accounts, to a rise of 47½ per cent. in the price of wood—presumably, upwards of 50 per cent. is more correct. I ask any man of business if such a statement be compatible with what ought to emanate from a party entrusted with a responsible position? According to the *Timber Trades Journal* of Oct. 25, the timber trade is worse than it was last year at this period, without any indications of improvement, the stocks of wood goods being considerably in excess of the importations at a similar period last year—that of deals heavier than at any previous season. This said party further stated “the railway was not quite so much ‘in nubibus’ as it was some time ago.” I have said so much on this scheme that I only challenge the said gentleman to develop what he *bona fide* meant to convey for the material benefit of the company and his employer by such a statement. He stated, in addition, that “including the stocks of wood and iron, the whole estate, he thought, would, if valued as a going concern, be sufficient to pay the mortgages, but not otherwise. Now, how could he make such a statement with 7½ loss on the iron, loss on the wood, the wood trade, as just quoted, being worse than when such loss was made on their shipments, loss on Arctic farms, loss on steamers. If he calls such a going concern, it reminds me of the once popular tale of the old woman rejoicing over a large trade at a heavy loss on her goods, which ended in her ruin. I reiterate my sole object is to convert the Gellivare iron ore into pure steel free from phosphorus and sulphur, and to bring the wood produce of the estate to market at a reduction of 3½ a standard by my practical system, as developed in the *Journal*, and which I am prepared to submit to the scrutiny of practical men. I am acting in the interest of both mortgagees and shareholders, without looking to any compensation until my system of fusion and transport has been declared practical, and effecting a great saving. Upon a portion of such saving I base my prospective remuneration. The Gellivare Company (Limited) were endowed with a much more capable directorate than the New Gellivare Company (Limited), and they are in liquidation, and the New Gellivare Company are in a much worse position. I invite the chief creditor of the company to summon his delegate director, and I hold myself prepared to respond to any invitation to a meeting, when the issue will, I am confident, de-

cide the said chief creditor to adopt such measures as will eventually bring the Gellivare steel into the market, and the wood produce free from existing loss. WM. JOSEPH THOMPSON.

Little Toner-street, Nov. 11.

CENTRAL RAILROAD COMPANY OF NEW JERSEY.

SIR.—Allow me to point out an anomaly in the ordinary shares and the 7 per cent. income bonds of this company. The shares represent a capital of \$20,600,000 and the bonds \$2,450,000, which is rather less than one-eighth part. The bonds must be paid in full before any dividend is paid on the shares, and they are both at about the same price—88 to 90. Investors and others can form their own opinion as to the merits of the 7 per cent. income bonds and the ordinary shares.—Nov. 13. B. E.

THE INSTANTANEOUS FUSE AND IGNITER.

SIR.—A few words from us seem to be called for by Mr. Barkell's letter, in last week's *Journal*. We regret that Mr. Barkell was not present at the public trial of our patent instantaneous fuse and igniter, at Wheel Agar, on the 30th ult., as we think that the results then demonstrated would have modified his premature criticisms on our inventions. At the present moment we are not acquainted with the nature of the arrangements which Mr. Barkell says he devised more than twelve months ago, nor aware what experiments he then tried. We shall be very interested to learn whether he manufactured an instantaneous fuse or one approximately as rapid as ours of that name. If not, then we should be quite prepared to learn that electric fuses were preferred to his arrangement by any person requiring simultaneous blasting, for it may be considered certain that the simultaneous ignition of several charges can be ensured only by the use of an electric or other instantaneous fuse.

But whilst we admit our ignorance of Mr. Barkell's appliances we must suppose that he is similarly unacquainted with our patent igniter as exhibited at the Mining Institute. He would not otherwise speak of its being “highly dangerous,” for in no one respect can it be considered more dangerous than our old safety fuse, which now for nearly half a century has been the means of saving so many hundreds of lives. The ends of the instantaneous fuse are protected from the “accidental sparks” which your correspondent supposes are dropping about, and the only means of igniting them is by the well known slow burning safety fuse, which communicates with them in the igniter. We may add that neither our instantaneous fuse nor our explosive discs contain any detonating substance nor anything which ignites at a lower temperature, or is more susceptible to concussion or friction than the prepared gunpowder in the old safety fuse itself.

Mr. Barkell further denounces the “lavish waste of fuse” involved in our arrangement. To this we have simply to answer that we are perfectly prepared at any time to compare the results, financially as well as otherwise, shown by the use of Bickford's patent igniters with those obtained by the Bornhardt or any other electric appliance. We greatly regret that the Bornhardt machine, though on the ground at Wheel Agar, was not tested as had been publicly announced. Tuckingsmill, Cornwall, Nov. 12. BICKFORD, SMITH, AND CO.

DARLINGTON'S ROCK DRILL.

SIR.—Mr. Waddington has given us his wail betimes—very much like the boy who shouted before he was hurt. This year it is “very sorry, but my numerous engagements,” &c. Last year it was “very sorry, but the drill-clamp has been forgotten,” &c. As this seems likely to become an annual custom people here in Cornwall are beginning to speculate as to what his wail will be next year; in fact, bets have already been made on the subject. With all his lamentations, however, the fact still remains that although the Darlington Drill has been in the county several years (and entered for competition at least on two occasions to my knowledge) it has never competed in any of the annual trials held by the Mining Institute of Cornwall; and further, notwithstanding all Mr. Waddington's tall talk, the Darlington Drill is rapidly declining in the estimation of us Cornish folk.—Pool, Nov. 10. H. WILLIMOTT.

ROCK-DRILLS.

SIR.—In last week's *Journal* we notice a letter from H. Waddington commenting upon the trial of rock-drills at Wheel Agar Mine on the 30th ult. We also note the lamentations of that gentleman at not being able to be present at the trial. We, on our part, are very sorry he was not there; provided he means what he has stated—that he would have competed with the Darlington Drill. But how does Mr. Waddington reconcile facts with his regrets? In 1878 the Darlington Drill was entered for competition at the trial which took place at the Dolcoath Mine. Mr. Waddington was present, but declined to run the drill in question. This year a gentleman attended for the purpose of competing with this drill. Before the time for trial arrived a private run with the drill took place, after which it was taken off the bar and was no more heard of. We mention these facts, not by way of depreciating the merits of the Darlington Drill, but merely to show that there must be some cause, other than Mr. Waddington has given, why the Darlington Drill did not compete either this or last year. We also notice Mr. Waddington has thrown out a challenge. We can only say in reply that we are prepared to meet him and contest the Eclipse against the Darlington either alone or with others. That Mr. Waddington has some spite against the Eclipse Drill is evident, but from what cause we are at a loss to understand, unless it is on account of the good name it has attained for its staying powers in Cornwall. In all we do our object is, not to depreciate the merits of any other drill, but to get to work alongside them and let others judge of its merits. That we have got our drills into Cornwall and Devon and mean to keep them is a certainty. We know mines in Cornwall in which drills have been put to work and taken out again. Not so with the “boasted” Eclipse. In conclusion, we beg to say that as soon as Mr. Waddington is in readiness for the contest we shall be glad to hear from him to arrange matters.—London, Nov. 13. HATHORN AND CO.

ROCK BORING MACHINERY.

SIR.—With an improving metal market, increased attention is naturally directed to the best and cheapest means of more rapidly opening up the resources of our metalliferous mines. Much has been done in this direction by abolishing time-worn customs, spurring the miner on out of the old groove, affording facilities for descent and ascent, improving the system of working generally, and by the introduction of most powerful explosives; but all this falls short of the requirements of the times. The proper thing for all hard ground mines is rock boring machinery. After all that has appeared in your *Journal* on the subject one is amazed at the amount of stupid incredulity that still exists as to whether such a mode of sinking is an established success. To some extent I attribute this prevalent unbelief to proprietors of boring machines themselves. They have made such extravagant, unscrupulous, and I was going to say lying, assertions as to the capabilities of their machines, which when practically tried have proved wretched failures, that to some the very name of “drill” is synonymous with disappointment and disgust.

Here is one claiming such a combination of excellencies for his machine that it will bore ground at a magical rate with 2½ atmospheres, when any common sense man must know that the resistance of a hard rock can only be overcome by an equivalent consumption of power, and that the lower the working pressure the larger the axle of the machine must be to secure effective boring.

Here is another maker asserting that his is the most effective, the most steady, the most economical, and the most durable, the only limit to the “most” being the exhaustion of all the adjectives. Now the “proof of the pudding is in eating,” and the proof of the machine is in its uses, by that let it stand or fall. I would, therefore, suggest that mine agents who have charge of boring machines keep correct memoranda of the work actually accomplished by the machines, and if they choose publish it periodically for the guidance of others who are purposing to adopt them, but are bewildered by the contradictory statements of various makers. The miner would

then have disinterested and independent testimony as to the merits of respective machines, and the result would be their introduction into most well conducted mines. A proper form for tabulating the boring, blasting, and general operations can be procured, so the work it entails is not considerable. Such memoranda enabled Mr. King in last week's *Journal* to give particulars of 11 weeks' working here, and I think they speak both for the merits of the machine and the advantages of mechanical sinking. I have suggested a further improvement in the system we employed, and I feel confident that with one single Darlington Drill constructed by Sandycroft Foundry Company we could penetrate any ordinary killas strata at the rate of 14 yards per week. JOHN BARKELL.

Rushen Mine, Isle of Man, Nov. 11.

WHEEL AGAR—BORING MACHINERY.

SIR.—In last week's *Journal* Mr. H. Waddington writes respecting a trial of boring machines which took place at the above mine on Sept. 30, under the superintendence of the Council of the Mining Institute of Cornwall. Five drills are reported to have been entered for trial—the Darlington, Champion, Barrow, and the Eclipse—to be worked by compressed air; also Jordan's hand-power drill, driven, as its name implies, by manual labour. Out of this number Jordan's, the Champion, and the Eclipse were the only drills tried. For some reason or other the Barrow drill, although exhibited at the Druids' Hall in Redruth, did not put in an appearance. The large 4-inch Darlington drill, which was to have been pitted against its 3-inch rival, was tried in the forenoon of the competition day on the test rock, and bored a hole 1½ in. diameter 4 in. deep in two minutes, with air at a pressure of about 65 lbs. to the square inch. As the hour for the approaching contest drew on the Darlington was “wanted” underground, and it was on that day seen no more.

Mr. Waddington writes—“Had I been there the Darlington drill would have been tried with the others.” I rather wonder at this remark, as Mr. Darlington's chief engineer had come down on a special errand from London to superintend his drill at the trial.

Now, Mr. Waddington talks about the wonderful work performed by the Darlington drill at a later date, on the same rock, giving figures which might prove delusive to the unwary. He states that a 2-in. hole was bored 21 in. deep in 5½ minutes; also another hole, 1½ in. diameter, 19½ in. deep, in 4½ minutes. This penetration (not the average of the two holes) he reckons as 4.41 in. per minute. He forgets to tell his readers the pressure of air used during his experiments, and above all he omits to mention that his drill was of 4-in. diameter piston. He conceals also the fact that the Eclipse drill used at the contest was only a 3-in. diameter piston, but merely refers to it as the “boasted Eclipse,” having with a 1½-inch borer bored in 7 minutes 20 seconds a hole 20 in. deep, or 2.72 in. per minute, and makes no reference to the fact that the Eclipse worked with an average pressure of 58 lbs. only.

Before Mr. Waddington issued his challenge to all comers he ought to have studied fair play a little more than he has, by at least having his drill of the same diameter in the piston as those of his competitors, for this is really the basis on which the comparison should be established. If, as a practical man would have done, he had reduced his work to arithmetical calculation, he would have found it wiser not to have thrown down the glove to the “boasted” Eclipse—or, as evinced by his remarks, the “envied” Eclipse—until a true comparison of the work of the rival drills had been made.

The correct results are as follow, giving the fastest of his own experiments as the basis.—The Darlington 4-in. drill: Air, 65 lbs. to the square inch; hole, 1½ in. diam.—depth, 19½ in.; time, 4½ minutes, equals 54.875 cubic inches of rock out (supposing no wear of bit and consequent diminution of area of hole), equivalent to a Darlington 3-in. drill cutting 30.87 cubic inches in the same time. The 3-in. Eclipse in 7 minutes 20 seconds cut 55.22 cubic inches of rock, or in 4½ minutes would have cut 33.90 cubic inches, giving an advantage over a 3-in. Darlington of 3.03 cubic inches. The difference in the pressure of air at the respective trials is not here taken into account.

If the Darlington bit were away ¼ in. in diameter, which no doubt was the case, the cubic inches of rock cut would then stand as 47.80 instead of 54.87, representing operations still more in favour of the Eclipse. The Eclipse began with a hole 1 15-16ths in., and ended, in consequence of the wearing of the bit, with one 1 13-16ths in. in diameter, or averaging 1½ in., and this, too, with a cross bit, as compared with the chisel bit of the Darlington—a difference which miners will readily appreciate. I should like to know what the Darlington borer hole commenced and ended with, so that its average might be ascertained. I have no doubt the whole truth, if revealed, would still further show the superior rock-boring powers of the Eclipse drill.

HARRY TEAGUE,
Agent for Messrs. Henderson and Son, Truro.

TREATMENT OF TIN ORES.

SIR.—I am highly gratified to see Mr. Green considers my acceptance of his explanation sufficient apology on my part. As to being bound while replying to one person to read the productions of another, I think it quite anomalous for anyone to follow a subject for several weeks, as Mr. Green profess to have done, and then omit what was said on it the very week previous to that on which he commenced writing on the same in such a very serious mood, which in this case has made it appear as if he took the matter up where I dropped it, and hence the squabble. I perfectly agree with him when he says I must have known his system so far as at present worked out was not my classifier and separator, and I only complained of his having insinuated the contrary to the public. But how he assumes it is untrue I do not see so clearly, and if he will kindly refer to my last he will see that sufficient experiment has been made to enable us to form a very high opinion of it, and I may add to assure him that it does effect the two operations in the same apparatus, and at the same time.

I wish Mr. Green every success in his project to deal with tin, and thank him very cordially for his offer to send me a specification of his separator, so that I may see how far it agrees with mine, but referring to his letter of the 25th ult. I find he admits there is something original in it, and also that there is a very material difference both in the construction and working of the two; and coupling this with the fact that his was patented seven years ago, and never yet honoured with a trial, and bearing in mind the indignity which accompanied this admission, and the consequent importance it gives it, I will refrain from troubling him for a specification merely for my own satisfaction; but I should consider it a much greater favour if Mr. Green would kindly publish it with an illustration, as it would no doubt be exceedingly interesting to all who have followed the subject, more especially as it has been raised from oblivion by the appearance of one which, according to his own description, has some original in it, and differing from it very materially both in the construction and working. But notwithstanding this great difference, and the silent contempt in which it has lain for seven long years, with a view to relieving it from this ponderous burden of contempt, and provided especially we could agree as to terms, I would not object to cross the two. In replying to Mr. Green's letter of the 25th ult., I passed over this part of the subject, being thoroughly satisfied with his admission of a very distinct difference in the two, and as the said apparatus of his was patented seven years ago; and never honoured with a trial, I considered it quite beneath my notice, but possibly it may have some good points, and if crossed with something of a higher class, it may be treated in the next seven years with more significance than it has in the last; therefore consider it highly important that it should be published.

I am pleased to say, in addition to slime dressing, some improvements also have been lately introduced in the mode of crushing, and taking the waste off the jiggers, by which the new patent Marsden stone-breaker is combined with the Cornish crusher so as to crush 100 tons of the hardest rocks to fine sand per day at a great economy of steam-power. The advantage being derived solely from the wonderful improvement in this new patent stone-breaker. The ore is passed from the crusher to the jiggers automatically, and is more economically classified. The waste is taken off the jiggers also automatically, so that the only cost when driven by water-power is just a hand or two to look after it, which does not exceed 2d. per ton of

ore treated, including wear and tear of machinery, and when driven by steam $\frac{1}{2}$ d. per ton of ore treated. This will no doubt enable us to work an immense quantity of low-grade ore at enormous profits, which have hitherto been neglected, and I have not the least doubt that a combination of these machines with the boring-machine, when adopted, will make our mines very much more profitable than they have ever been.—*North Shields, Nov. 12.* W. NANCE.

THE COPPER TRADE—THE CAMBRIAN COMPANY.

SIR,—In my letter, published in last Saturday's Journal, in proof of the argument I was endeavouring to deduce—that the price of copper would not be affected by the production of the mines of England—I stated that, not a single ton of copper from the Cambrian Mines had been as yet sold. I find I was in error in this, and that the actual quantity of copper ore sold by that company since the month of April, 1878, was 396 tons of copper ore, containing about 65 tons of pure copper. As the statement contained in my letter is believed by the directors to be calculated to injure the prospects of the Cambrian Mines I hasten to make this correction, and to express my regret that I should have been inadvertently led into an error of fact, the publication of which, unless corrected, might prejudice the interests of the Cambrian Company. ERNEST HAWKINS, Plough-court, Nov. 14. Sworn Metal Broker.

THE FLAGSTAFF SILVER MINING COMPANY OF UTAH.

SIR,—I have read with much surprise, to say the least, the unwarranted and inopportune letter of Mr. E. Pearson, in the Journal of last week, in which he accuses me of making certain erroneous statements in my letter of Oct. 25; but I think I shall be able to disprove everything in connection with myself he has been pleased to call into question.

In the early part of last year, having heard that Mr. E. Pearson was in possession of a certain offer from the owners, or reputed owners, of the Flagstaff Mine and adjoining properties, I sought an interview with him, and he read to me part of a letter purporting to have been written by the legal representative of the holders to the effect that they were willing to sell their respective claims at a price which, as represented, appeared to both my friends and myself a reasonable sum, the terms being one-half in cash and one-half in the shares of a new company. At that time the appeal suits of "Tarbet" and "Davis" were undecided, and in consequence of this I informed him that nothing could be done until the decisions in these appeal cases had been given, the terms of the original judgment in the Davis case having made it impossible to redeem under the sale by the judgment creditor within the six months required by law, though the Chairman had visited Utah for the express purpose of so redeeming. When, however, the "Tarbet" and "Davis" appeals—the former of which was decided against, and the latter in favour of, the company—were disposed of Mr. Pearson sought my advice and solicited my assistance in drawing up a draft prospectus to be submitted to the holders in America. I at length reluctantly acceded to his request. This draft prospectus was sent to America, and after the lapse of about two months was returned almost entirely altered, and to my surprise the price was also altered from the amount previously mentioned to a much larger sum. Mr. Pearson received a letter with the draft prospectus, the contents of which he declined to communicate to me. In that letter I have no doubt was stated the reason of the alteration of the terms as at first proposed; and as I had had to do with the draft prospectus I considered that Mr. Pearson was not acting right towards me by withholding the information respecting the alteration of terms, and I have not since that time been permitted to know what the new terms were, nor how much was required for the several claims, although I have constantly made written as well as verbal application to him for information. Neither in the draft prospectus sent out nor in the one returned—at least as far as I know—were the terms of purchase stated; the latter document merely mentioned that the purchase price would be so much, "or may be less." It was the last-named document that Mr. Pearson facetiously states he "allowed" me to take away for a few hours, when, in fact, he again pressed for my attention, and I looked through it. This document, as I have before stated, did not contain any terms of purchase, and only alluded to price in the most vague and indefinite way. So you will see, Mr. Editor, Mr. Pearson is not correct in stating that "he discussed with me the terms upon which the vendors or present holders of the property were willing to transfer the mine to a new company." I have letters from Mr. Pearson in my possession to prove this. Mr. Pearson refers to the evidence of those who were present when these things were discussed; but it not unfrequently happened that his clerk would obtrude his presence upon us, but with this exception we have usually been alone. I know too well Mr. Pearson's propensity for witnesses at his interviews. As to my veracity, I should put a very poor estimate upon it if I only placed it in the same balance as Mr. Pearson's. Before I dismiss this subject I most distinctly assert that Mr. Pearson has positively declined to inform me the terms upon which, as he says, he is empowered to offer the various claims for the purpose of forming a new company. When I stated that the directors would not have been justified in calling the shareholders together I, of course, intended to convey that it was useless calling them together to hear certain proposals which I was not at all satisfied Mr. Pearson was in a position to offer, especially as there was no expressed desire on the part of the shareholders for a general meeting.

As to calling them together to inform them, as "Lawyer" expresses it, "how they and their property have parted company," they have been frequently informed by circular; but if any more explicit knowledge be required no doubt Mr. Pearson could tell them much better than the directors how this disaster occurred. The shareholders were informed over two years ago (at which time Mr. Pearson himself was a director of the company) that the property had passed into the hands of a judgment creditor. They were told later on the condition of affairs as regarded the Tarbet and Davis suits, and they have since been distinctly informed of the loss of their property. What more does Mr. Pearson want? The directors—as director of the old company—can have nothing to do with the proposed purchase of the property, inasmuch as the vendors positively refuse to sell to the old company; but as private individuals they can, and the part Prof. Vincent is taking in the matter is now and has been in his capacity as a share and debenture holder, and he is most ably supported by influential parties; but Mr. Pearson is going beyond the bounds of prudence—I may say of truth—in asserting there is an objection to the Chairman being in any way connected with the new concern. This expression only shows how far a man may be led away by prejudice. Mr. Pearson's uncalculated allusion to the board as being practically comprised of only one director is certainly in the worst form of bad taste. I, as secretary, may be allowed to state that the directors—one and all—do their utmost duty to the shares. It is quite ludicrous to read so much about "Mr. Pearson's instructions from the owner," "his proposals," &c., but when we come to the statement that it was he who advised a compromise of the petitions and actions so long pending against the company, "and my advice has been accepted," it is a matter far beyond a joke. Why, Sir, Mr. E. Pearson (who, as you are no doubt aware, was formerly a director of the company) has thrown every obstacle in the way of the directors and the progress of the company during the last 18 months. He then (as I stated in my letter of last week) presented a petition, through Mr. Ruffie, to wind-up the company, and ever since that time has been doing all he could to get the company wound-up, and now he has the audacity to affirm that he had advised the compromise. I assure you it is a fact that for some two or three weeks past he has been advising shareholders to sell their shares, as the company was sure to be wound-up, even asserting that he was going to do it. The initiative in the settlement of the petitions was taken by a friend of the company, and the conditions imposed were only reluctantly accepted by Mr. Pearson in fear of his being separated from the other claimants, and left out in the cold to steer his own frail craft single-handed. And yet he of all men (in his letter to you of last week) claims credit for "advising a compromise." The receipt I hold in settlement in full of the petitions will prove the correctness of my statement, and any shareholder can inspect it at the company's offices. Manifestly Mr. Pearson would have the shareholders believe that

he is interesting himself in their behalf. As a matter of fact, I very much doubt whether he has any influence with shareholders, except with such as are waylaid on their way to the company's offices, which, unfortunately, are on the floor above that on which he some time back took a room, and which is approached by the same staircase.

In another portion of your Journal I read a paragraph to which I must especially draw your attention, in which your correspondent states that it is proposed to form a new company by purchasing and working a property "other" than that which formerly belonged to the present company. Now, this is calculated to seriously mislead. The property proposed to be purchased is exactly the same property which has been held and worked by the present Flagstaff Company for the last eight years, and neither the directors nor myself would think of advising present shareholders to go into any other mine than the Flagstaff proper.

In concluding this letter, I beg to state that as no good can result to anybody in prolonging this discussion, and as from what I have stated it will be evident to shareholders of the company that Mr. Pearson has his own particular ends to serve in his attacks upon me at this juncture, I will leave him in that silence which the shareholders in general accord to him.—*Nov. 12.* A. A. DE METZ, Secretary.

THE FLAGSTAFF SILVER MINING COMPANY OF UTAH.

SIR,—I have read with some interest the letter from the secretary of the Flagstaff Company which appeared in last Saturday's Journal. I am satisfied in my own mind that if the shareholders will only take the trouble to interest themselves in the future of the company there is every prospect of the undertaking proving a success in the end. The recent rise in the price of Flagstaff shares is only what was expected when a revival in the mining market set in. The rise would have been much higher but for attempts of some parties to bring discredit on the company, and on those who have been freeing it from the lawsuits which have hung over it for some years. My advice to the shareholders is not to part with their holdings at the present prices. If they wait a little longer the shares will probably go to 3/ or 4/. The shares are well held, and among the 800 shareholders there is almost an entire absence of Stock Exchange men. The dealers and jobbers will, no doubt, be coming into the market now, and if they want to buy Flagstaff shares the shareholders ought to make them pay well for them. A SHAREHOLDER.

Nov. 11.

THE PANULCILLO COPPER COMPANY.

SIR,—In the Journal of October 18 I ventured to draw attention to the improved position and the brilliant prospects of the Panulcillo Copper Company. My communication to you was based upon authentic information, and could not but be confirmed by the directors' report issued shortly afterwards, and presented to the shareholders' meeting held on November 4; in fact, I rather understated matters than otherwise, and the official statements, at the meeting especially, went far beyond my averments. Anyone may easily test the accuracy of this simply by comparing my notes with the report of the meeting, as published by the *Mining Journal* of Saturday last. It was announced by the Chairman at the meeting that the net profit of the Panulcillo during the four months ending October 31 amounted to 13,500/—that is to say, at the rate of more than 40,000/ per annum. Considering that the debenture debt now only requires an annual charge of 4000/ whilst all other expenses in London (taxes, rent, salaries, &c.) do not exceed 1400/ per annum, so that 5400/ covers everything, it follows that, with net profits of 40,500/ 35,000/ clear must remain for the shareholders, or about 18 per cent. upon the share capital of 200,000/. But it should be borne in mind that the above 35,000/ represents a minimum yearly profit. It is based upon the old copper prices—that is to say, 57/ to 58/ per ton, whereas it is now much higher—65/ to 66/. Taking that into consideration—also the circumstance that by the completion of the San Gregorio tunnel last month some 3000/ per annum will be saved—it is no exaggeration to say that the Panulcillo is now making profits at the rate of 50,000/ per annum net at the very least; this means 25 per cent., or 17 per 4/ share. Few other copper mines present such prospects. The ore reserves are constantly increasing. Last year they were estimated at 700,000 quintals metrico, and now at no less than 1,000,000 quintals (see Mr. Welch's mining report). Should copper rise, as is probable, profits would, of course, increase proportionally; in that case dividends of 30 to 50 per cent. might be confidently expected. It is the relative smallness of capital in the Panulcillo Company which makes such splendid results possible; it is but 200,000/, consequently a net profit of 20,000/ per annum is sufficient to pay a dividend of 10 per cent. In this respect the Panulcillo contrasts favourably with the New Quebrada Company, which must make a net profit of 36,000/ per annum before the shareholders can get 10 per cent., and above all with the Rio Tinto Company and its enormous share capital of 2,250,000/. The Cape Copper Company alone amongst the large foreign undertakings (I mean copper mines, of course) is better off as to capital, but then its 77 shares stand at 31/ When I wrote on October 18 Panulcillo shares were 3/ per 4/ share. To-day they are at par, but I feel certain that they must before long rise to a considerable premium. Present prices are still absurdly low, considering the prospects. A PERMANENT SHAREHOLDER.

Nov. 13.

SOUTH WHEEL FRANCES.

SIR,—I beg to inform the shareholders of the above mine generally that it continues to look well, and that there is no alteration in any of the bargains since last reported. We continue to sell the usual quantity of tin ore at an advanced price, and a substantial profit will be shown at our next meeting (about three weeks from date). We are pleased to say there is no foundation for many of the remarks made by Messrs. Watson Brothers in last week's Journal respecting the above mine. No encroachment has been made in the West Basset boundary, nor anything approaching it. This baseless rumour is, therefore, unworthy of further comment. No inspecting agent has ever made a cross section of this mine; we have a transverse section of it, which admiring practical men have been allowed to copy—but how such a copy can be rendered unfavourable in the opinion of any practical miner we are unable to fathom. We consider it to be one of the most favourable features in connection with the future career of the mine. All questions affecting the interest of this mine have been discussed again and again at our general meetings, and verbatim reports sent to every outside shareholder, and if they are not well informed upon all vital points at issue and quite capable of forming their own opinions the executive cannot be held responsible for any neglect on their part. It is true Pascoe's shaft is not a good one; but it is quite as good as one-half of the shafts in the district, and we venture to hope that the adventurers, who have been receiving dividends from the mine for two years and upwards, will acknowledge the result to be very satisfactory. The condition of the shaft has been fully discussed at our general meetings, and its defects pointed out by the agents of the mine, and not by casual inspectors; indeed, it is all but impossible for any inspecting agent to give anything like a correct idea of what should be done. It is also true that a new shaft is being sunk in the western part of the mine; but it is not true that it must be sunk 180 fms. to cut the flat lode, or that it will take five years to accomplish this object. The 70 fm. level is driven almost under this shaft on the south lode, and is worth 15/ per fathom.

As soon as the boiler is placed in position we anticipate letting a special contract to a boring machine company, who will guarantee to sink it 70 fms. in twelve months, when a communication will be effected with the above level. We shall then be able to drive and stop sufficient ground on this lode to pay for the further sinking of this shaft to the 160 fm. level, where we expect a junction with the flat lode, and where we expect good results. No separate pumping-engine will be required for this shaft for years to come, as the new winding-engine will be sufficient for both purposes—pumping and drawing. During the past two years 5000/ has been spent in laying down tin-dressing floors and other necessary plant, and in the same period more than 10,000/ will have been distributed in dividends (including our next meeting), with tin at 35/ per ton. Notwithstanding the great outlay which has been made and is being made we

anticipate making a clear profit of 12,000/ for the year 1879, equal to about 1000/ per month, in spite of all obstacles. We have no desire to blow our own trumpets, or in any way to puff the mine up; but we feel it a duty incumbent upon us to give the other side of the picture painted so darkly by Messrs. Watson Brothers.

Redruth, Nov. 13.

A. T. JAMES.

WYE VALLEY MINING COMPANY.

SIR,—The evils of reconstitution of insolvent mining companies have been so many times pointed out in the Journal that I am sure you will allow me a little space to protest against the action which has been taken in the Wye Valley Company, in which I am unfortunately a shareholder, and which is too like one of those concerns which mysteriously pay a predetermined number of dividends before the mine has been developed, and thenceforward, worse than "the baseless fabric of a vision, leave but a wreck behind." It will be obvious to most commercial men that to sell unmerchantable goods for 3/ cash down, and guarantee the purchaser 10 per cent. interest for two years on the amount he has paid, is not unprofitable to the vendor, however much annoyance it may cause to the purchaser to lose his 2/ 8s. balance; but for all that it is not a strictly straightforward business transaction, and it would be most regrettable to see such a practice generally introduced into mining enterprise. There are abundance of mines in England and elsewhere, and producing all kinds of minerals (tin, copper, lead, &c.), that will yield enormous profits to capitalists in return for a moderate outlay and good management; but these are just the concerns which professional vendors who control, if they be not themselves the principals of, numerous firms which aim at profiting by the fees, salaries, and office charges of carrying on the companies instead of giving proper attention to the working of the mines, because the original owners of good properties will not sacrifice their prospect of royalties by placing their mines in the hands of such men, whilst the original owners of worthless concerns are but too ready to sign any kind of document, provided only they get a certain amount of cash down.

But to return to the questions of reconstitution and the Wye Valley Company, I consider the proposed arrangement most unjust to those shareholders who, like myself, have already paid in as much money as they care to do, and more than they are likely to get back again. The old company is in 10,000 shares of 3/ each, all paid, and 3750/ has to be provided to satisfy the debenture-holders. The shareholders do not doubt that the mine may be valuable; indeed with the present prospect of lead they feel that their chance is better than for some time, but this is no reason why they should be compelled to contribute 25 per cent. upon their present loss through their connection with the concern. A shareholder who has already sacrificed 1000/ is to have his property (worthless it may be) confiscated unless he puts in another 250/. This is ingenious but not generous, and a shareholders' committee should be at once formed to apply to the Court of Chancery to prevent the scheme being carried out. The shareholders as well as the debenture-holders ought to have fully-paid shares, and the discretion should be left to them as to whether they will subscribe another 25 per cent. Of course some shareholders would decline to subscribe, but if the mine be worth anything there surely should be no difficulty in getting outsiders to subscribe the balance of the 7500/ remaining when the shareholders have exercised their option. For my own part, indeed, I do not so much mind subscribing the 25 per cent., although I think the chances of its being lost are greater than the chances of profit as being compelled to subscribe. I detest compulsion, and especially when it will with many shareholders be synonymous with confiscation. PROFITLESS.

Nov. 14.

EAST CREBOR MINE.

SIR,—I am indebted to Messrs. Watson Brothers for calling attention to certain errors in the topographical remarks I sent you a week ago. They were partly the result of interlineations in my letter, and which either from transposition on the printer's part, or perhaps from hasty marking on my part as to the points these additions were intended to elucidate, produced as a result somewhat of a jumble. I think Messrs. Watson will find on enquiry that the ground of East Wheel Russell is locally known as Rantagator, although I confess I am uncertain of the orthography of the word. The lands locally known as Hollich Horn, or as I find it printed in the county directory as Hurditch Horn, were those in which the Wheel Crebor of a few years ago was in operation. To the east of that, and on the same lodes, and at a more recent period, the new ground of Wheel Crebor has been obtained by the present company, and the new shaft has been sunk since that ground was obtained, consequent upon certain pieces or parcels of land being exchanged by purchases for mutual convenience and adjustment of boundaries between His Grace the Duke of Bedford and the Right Hon. the Earl of Devon. Now, the new ground of Wheel Crebor may not actually have been included in the grant made to the old Crowndale party, although I fully believe it was, but not worked by them, but in any event it did not form any part of the Wheel Crebor until quite a recent period—say, within five years since; and all the improvements which have lately made themselves so tangibly felt have been in the eastern ground, and upon the Crowndale lodes. To the east of the western boundary of the Wheel Crebor sett is the ground which was worked, but to only a limited depth, by the old Crowndale party, and which Messrs. Watson say is only to be granted to the Crebor party if they require it. That being so the Crebor party are in luck, and I sincerely hope they may be able to realise their good fortune. There is very little doubt that the Crowndale lodes are enormously rich, and I think the wealth realised from their working by the original founder of Gill's Bank, Tavistock, may, according to local repute, be taken as good evidence. No doubt the memoranda which some of the Messrs. Gill could furnish would unfold a mining history of that part of nearly as much interest as the early history of its near neighbour, Wheel Maria, of Devon Great Consols celebrity. I do not wish it to be supposed that I undervalue Wheel Crebor; on the contrary, I contend its modern riches are obtained through its connection with the Crowndale lodes going eastward. The comparatively small piece of ground on the same run eastward, where the old Crowndale shaft and great water-wheel were placed, is not now being worked. The buildings of Crowndale Farm are in a line due east from the new shaft in Wheel Crebor, and, as is well known, have been modernised, and now form a notable contrast to the old buildings removed. On this point I quote the words of a local historian, when speaking of Crowndale Farm and Sir Francis Drake, Queen Elizabeth's Vice-Admiral of England:—"Here Drake was born, and here stood the old barn-looking cottage (for it was no better) in which he first drew breath, with its antique windows, and all its character of past time about it, till—alas for modern innovation!—this poor building, which should have been held sacred as long as one stone would rest upon another, was pulled down to give place to an ox stall, or some such common appendage of the farmhouse hard by."

The Tavistock Canal and the River Tavy form the eastern boundary of the Crowndale sett, and the latter the western boundary of East Crebor sett, and, as the crow flies, is about a quarter of a mile from the new shaft in the new ground of Wheel Crebor. If local opinion is worth anything, the riches of East Crebor are likely to offer a fair comparison with those of Wheel Crebor-Crowndale, and, share for share, the East Crebor is believed to be the better of the two by many who know both. Old Wheel Crebor was worked first upon a piece of ground which the agent of the owner was then prepared to sell in fee for 350/. to a hard-fisted farmer, who, after the fashion of his craft, higgled at the price, and offered 250/ for it. But, after "sleeping on it," he came back in the morning to close the bargain; by this time the agent had slept upon it too, and then refused to take 350/. The farmer went off disgusted, and in less than seven years from the night of that eventful "nap" the owner of that piece of land had received in mineral dues from it upwards of 14,000/ and had retained the fee simple of his land. To the east of that point Old Crowndale yielded its wealth at a shallow depth, and a little further east were the workings of East Crebor, which with two lodes of great riches are now coming together, and in 8 or 10 fathoms further sinking, and with a large quantity of rich ore actually broken ready to be drawn to surface, was left to be utilised at "a more convenient season."

That season is now at hand, as this ground is being approached by the miners on East Crebor.

To the south, and within the boundary of the sett, are other very rich lodes of copper and tin, which some few years ago were only pierced by the company, which for a very short while were worked, with utterly inadequate funds, as West Rixhill. I hope the East Crebor party will not shut their eyes to this valuable store they have waiting their working. It would well repay them for their attention, I have no doubt the lodes known as the Devon and Courtenay and the Courtenay lodes run through it; the latter, I believe under the title of South Crebor, has just been brought before the public. The wealth of East Crebor is simply unknown, and I am glad to find the new company are likely to turn to good account so very valuable a property. If they had had the courage to have united with East Crebor the adjoining mines, called Rixhill and Anderton, they would have had no rival to their riches in copper and tin, and the Crelake lead cross-course which runs through that ground,

AN OCCASIONAL ADVENTURER.

WHEAL CREBOR.

SIR,—Now that the excitement in connection with the discoveries at this mine has subsided we are able to look at the position of matters more calmly, and see with a little more accuracy how the concern stands. I was much pleased to read your report of the meeting in last week's Journal. It portrayed a satisfactory present and a prosperous future, and if indications are anything to be guided by your portraiture was not ill founded. We are told of what is raised and being raised from the mine, that the reserves already discovered may be valued at close upon 40,000*l.*, and that the prospects of further discoveries are so promising we may naturally conclude that the estimate of the Chairman (Mr. Watson) as to the profits likely to be realised during the next two months is rather under than over calculated. This in due course I have not a doubt we shall find to be in reality the case, and that when the operations in the 48 fm. level have been fully ascertained, and the workings in the lower levels been further developed, we shall have a mine paying 10*s.* instead of 5*s.* (as promised) per share on each four months' workings. It requires very little calculation to show that this would be equivalent to a dividend on the present price of shares of 30 per cent. per annum. I think now that the "bulling" and "bearing" operators have exhausted themselves in connection with the shares we (the shareholders) have each and all of us reason to be thankful that we are possessed of such a valuable property, and with a continued and improving market for our mineral our success in the future will be for a certainty be secured.

Nov. 13.

MINING IN MONTGOMERYSHIRE, AND NORTH WALES CORRESPONDENT.

SIR,—In the first place I must correct an error that crept in my letter in last week's Journal by some means or other, for instead of "We find the lower Silurian for at least two miles to the east of Llawrlyn," it should have been *six* miles, and then I think I am within the mark, and shall be very pleased to read in your next issue your North Wales Correspondent's reason why he thinks that copper may not be found in paying quantities in that locality. Perhaps he may be one of those who about 15 or 20 years ago falsely prophesied that lead would never be found east of the Clywedog river, and has now changed his song from lead to copper, seeing that his first prediction was not verified by actual results, for now the great Van Mine has furnished a grave to hide their diminished prophetic heads, and I shall not be at all surprised if at some future day a copper mine in Llawrlyn equal in magnitude to the Van Lead Mine will be found, and then be the means of convincing and silencing the random statements of your prophetic (?) North Wales Correspondent. The mines to the west of Trefeglwys have shared greatly the depression (which I hope is now about departing to a very appreciable extent); for instance, the Van has curtailed its output to less than one-half of its usual output, and Van Consols, between one thing and another, has been hanging on as it were between two worlds. This mine has not been fairly worked—that I think no one who knows anything of their doings can or will deny, for during the lifetime of their late secretary and London manager their local manager's hands were tied, so to speak, so that he could not carry on as he wished. Had he been allowed to do so there would have been quite a different aspect on the affairs of the company than there is at present, as there is no questioning Capt. Roach's ability as a thorough good miner during the past six or nine months, when the conduct of the working of the mine has been left solely in his hands. I find the results there have wonderfully improved—so much so that they have a good pile of lead in course of dressing, and also some rich-looking carbonate of baryta, and if they have much of the same kind of ground to work upon that produced the ore I saw on surface a few weeks ago they will, with the united action of all concerned, place the affairs of the mine on the right side of the ledger. It does not sound well—does it, Mr. Editor?—to have a disunited company in what is termed a United mine. If they pull together, and leave the underground operations in the hands of Captain Roach, they will, I believe, be able to stem the tide of their difficulties. Adjoining, again to the west, is the Aberdaunt Mine, which has suffered materially for want of capital, and what capital has been spent there seems to have been frittered away in superficial scratchings here, there, and everywhere. The appearance of the lode on the south-western side of the hill should warrant their sinking upon it to a good depth. In a short level driven on that side the lead and lode takes the form of an inverted wedge, widening from back to sole of level for the length driven. Further west, again, is the Gwestyn Mine, where I am told prospects are good, but not more so than the spirited and miner-like way in which the manager—Capt. John Kitto—develops the mines under his control. I hope success will crown his efforts at the Gwestyn Mines, as in other mines under his immediate supervision.

I will now leave the line of the Van lode, after having traversed its course from the new discovery near Trefeglwys to Gwestyn, and turn to my right towards Cefnhafof and South Dylife. Here again, I am sorry to say, all is as silent as the grave, save the sound of the drops of water percolating through the lode in the different parts of the workings, and I could not help heaving a sigh and exclaiming, "What a pity that such a splendid property as this is should be left idle, when there is every element of success visible." Certainly there is one drawback—that is its out-of-the-way position—but with such a liberal landlord as Sir W. W. Wynne, Bart., investors should not hesitate to embark their surplus capital in this property, as I have no doubt he would do everything within the bounds of reason to help matters on, as it is usual for him to do. Passing several minor trials on the back of some lodes north-west of this mine, towards Dyfnwgn and Dylife, I found the first-named mine at a complete standstill—from no cause within itself, but the stupidity of the owner, as here there is a mine well furnished with drawing and dressing machinery, all in good working order, and the water drained by a neighbouring mine to the 80 fm. level; for some score of fathoms on the sole of that level the lode is worth from 1 to 4 tons per fathom. I would humbly suggest to the proprietor that for his immediate benefit, and for the benefit of humanity suffering from want of work in the locality, that he should without loss of time set about working this mine in an energetic manner. No one knows better than himself that by so doing he would not only benefit himself, but also many poor working men and their families, who, loving their old habitations, do not like to migrate from there, and no doubt there are many heads of families who would hail with delight an offer from him of working the mine on tribute, leaving a good margin of profit to himself. A very extensive mine could be made here if an arrangement were come to with the Great Dylife Mining Company for the use of their shaft on the top of the hill, and a water-wheel and connections in the Clywedog valley, near to the Dyfnwgn farmhouse; they could then do away with the steam-engine and attending costs, which, considering the long distance coal has to be carted, must be very heavy to the Dylife Mining Company, who at present seem to be doing better than they have been for some time past, and with a better price for their produce it is very probable that the old mine will, under present management, and a further outlay in deepening their shaft, soon re-

enter the Dividend List, where it figured so very prominently for many years, and which formed the foundation of colossal fortunes to many of those proprietors who stuck to it from its early days. Last week I noticed in the Mining Correspondence that it is said the copper lode in Glaslyn Consols is the same as that of the Cambrian Mine. I might say, whatever their prospects are at the latter place, from the knowledge I have of the former, it will never want the help of a Cambrian crutch to help to carry it through, as there are sufficient riches in old Moel Fadian to make Glaslyn Consols independent of any of its neighbours, however good they may be. Let the new company furnish a moderate capital to drive under the old workings and erect machinery. They are safe for a permanent paying mine if properly managed; and also endeavour to get the landlords and other mining companies in the neighbourhood, and also the tenant farmers in the district lying between them and Machynlleth, to assist in making a tramway from the Cambrian Railway, connecting it therewith at the latter place, for the conveyance of the produce from and materials to the different mines, and also of lime, coal, &c., for the use of the farmers and other inhabitants. Would not this be worth the attention of the Imperial Tramways Company, who now work the Corris and Machynlleth tramway? A branch to this district could be worked under the same management, and a less amount of rolling stock would be required than if worked by another company. I have no doubt this would prove another source of profit to the Imperial. The owners of the land through which it would have to pass would no doubt meet the company in an honourable manner, and I think that to assist tenant farmers in outlying districts to compete successfully with others better situated as regards transit of lime, &c., to and produce from their different holdings, that landlords could do nothing better for themselves and tenants in the district referred to than by helping them to have a tramway such as that which connects Corris and Machynlleth. I hope this suggestion will be taken up by those whose interests it would affect. I see I have glided from mining to railway making, and will for this week close my note book.

Nov. 12.

MINER.

MINING IN THE LLANARMON DISTRICT.

SIR,—Having explained as fully as I could the prospects opening in explorations on the Old Westminster range of lodes, and the almost certain success which is likely to result therefrom, as predicted long ago, when the old mines were at their pinnacle of prosperity, I would now beg to call attention to an entirely new range of mineral vein in a country to the north, called the Bodidris Mine. It was in this locality I remember to have heard strong opinions given that when the proper bearing stratification should be pierced riches as abundant as its neighbouring mine would be discovered; and the reasons then adduced were several, amongst which were—firstly, that the stratification in each was identical, the strike being in a north and south direction, and the dip eastward; secondly, these measures being traversed by the same bands of alderoe and shale, and also by the same cross-courses (15° east of north), running in a north and south direction; and, thirdly, that the veins already discovered were in a true lead-bearing direction, bold in size, similar to all rich veins in compounds, and equally as productive as others had been outside the confines of their mineral limits. I rejoice to see a verification of the fact is already made manifest by the indomitable perseverance, energy, and skill displayed by the company who have the good fortune to work this extensive property. Already had large regular returns been made in the Old Craiglog, and meagre attempts made to prosecute the working on one only of the master veins discovered, by means of an old atmospheric engine and other primitive appliances; but the whole concern fell into a state of torpor, and remained so for years, until the present spirited public company took it in hand; and they have so far developed two other main lodes in their best bearing direction, as to lay open most important discoveries of lead ore, and more particularly so in a recent discovery on the south lode (Maes-y-Pyll), which seems to bear out to the fullest extent the probability of the Bodidris Mine proving as rich in the eastern measures as the Old Westminster. It is certainly gratifying to find that in almost every instance where trials have been made in the locality the results would seem to indicate undoubted success; and whilst mentioning this property, I may again point to a new discovery made on the last named lode (Maes-y-Pyll) more than $\frac{1}{2}$ mile to the west of the Bodidris workings, called the Plas Du Mine, which I am informed is now producing splendid ore even so far westward, in a rich run of ore dipping eastward. In the Bodidris Mine I should state that the discoveries are so far proved as to assure the success of a most extensive mine for years to come; and already adequate machinery is, I am informed, in course of preparation for effectually dealing with it as required for present emergencies.

OBSERVER.

THE LLANRWST DISTRICT—No. III.

SIR,—The next leading mine of the central group of this district which I proceed to notice is the Pandora, situate about half-a-mile north-west of the Bettws-y-Coed Mine, and has already afforded ample proof of its productive capacity both of blende and lead ores. Like its neighbours of the same group it is but yet a shallow mine. I believe its greatest depth does not exceed 30 fms. from surface. If I am correctly informed sales of lead ore varying from 15 tons to 25 tons per month have been made from this mine, with but slight intermissions, for about seven years past, in addition to several hundred tons of blende, without in any way exhausting the resources of the mine at that depth, whilst the appearance and productiveness of the several lodes at the lower levels are such as to indicate most forcibly that not only continuous but increased fertility of products will be found at each succeeding deeper level for a long time to come. It is to be regretted that much more vigorous operations are not in progress to open up and make available the unquestionably large resources of the mine in depth. There can be no doubt entertained by those who know the property of its being fully equal at a comparatively early stage of its advancement to the production of at least 100 tons of lead ore per month, in addition to a large quantity of good blende, and not as a spurt but a legitimate yield, to be continued for years and years to come. The proceeds of the workings in the past of its history, together with the improved appearance and condition of the mine, is ample evidence—if not a sufficient guarantee—of its future success and profitable working. That the mine has all the elements of success attaching to it cannot be doubted, and it only remains to prosecute it with that vigour and resolution which its glowing prospects so entitle it to achieve so desirable a result. It may be necessary to provide some funds to realise this clearly indicated and well grounded expectation for the purpose of defraying expenses incident to the necessary dead work, such as sinking the engine-shaft, providing pitwork, &c. The amount required will be but trifling in comparison with the advantages and satisfactory results which would follow the enterprise. It is unaccountable that such valuable properties as there are here should be permitted to languish in comparative obscurity and neglect from the want of a modicum of the patronage so liberally extended to sensationally inflated bubbles, fantastically decorated phantoms, alluring ignis fatuus. The obtuseness of individuals is never more conspicuous and reprehensible than when they blindly and obstinately ignore their own interests for no better reason than that their expectations—crudely formed in too many instances—have not been realised precisely at the time and in the manner they had too fondly flattered themselves they would be, whereas a little sober reflection would have convinced them that the disappointment arose from delaying circumstances unforeseen and uncontrollable by any individual or largely combined effort, and that only a little more patience and perseverance were necessary on the right lines to realise the fullest and most satisfactory expectations originally formed and entertained respecting the enterprise. Such, I understand, has been the case with the Pandora Mine; but there the mine is, straightened though it be for the want of a comparatively small sum to put down the engine-shaft and more fully lay open the mine, which as certain as there is a good mine anywhere would be certain of opening a good mine there. It is not so much what a mine has done—although that in so young a mine as this speaks volumes—as what it is capable of doing on further and fuller development that it should be estimated by and appreciated. Promising young mines, like promising young

men, should be estimated prospectively, but the former with most assurance, as there are better and more tangible existing evidences of their value and its realisation.

That this mine, as well as the others of this estimable group, is destined to a brilliant future cannot be doubted, but this desirable consummation cannot be achieved but by a more spirited, vigorous, and determined course of development; but whether this necessary course will be adopted and desirable consummation arrived at by the present company or under the auspices of another will depend entirely on the will and procedure of the parties in possession. One thing I would remark is, that if the present depth of 30 fms. under the surface is the limit of their enterprise it would be easy to foretell its fate as respects the existing proprietary.

In ordinary mining in other districts 30 fathoms deep from surface is considered merely as prospecting, and should be so considered in this district, and no doubt would be but for the promising and prolific nature of the lodes, &c., near the surface, in regard of which too much is expected inconsistent with the ordinary events of mining. Expectations are formed rigidly destined to admit of no relaxation or subscribe to any modification rendered necessary by changing circumstances or the occurrence of unforeseen and uncontrollable events. So much was expected which not being realised proscription follow as a swift, unmitigated retribution. Perform or expiate, do or die, is the syllabus of the too numerous Shylocks of mining.

I have no other desire in this connection but that mining may not be held responsible and branded for the sins and delinquencies of its half-hearted, or rather no-hearted, patrons and questionable supporters.

VIDE ET CREDE.

CARDIGANSHIRE LEAD MINES.

SIR,—I have read with much pleasure the different letters which have recently appeared in the Journal in reference to the above mines, and I am fully persuaded that within three months from the present time Cardiganshire will be the principal attraction to capitalists and investors generally, as from the recent important discoveries made in mines surrounding this place and on every side of it, coupled with the introduction of rock-drills and an improved method of slime dressing, it is quite impossible to be otherwise; and those who take advantage of placing capital into them when shares in such mines as Bryn Glas, Nant-y-Moch, Bwlch United, Cwm Priff, and a host of others, must reap a rich reward for so doing. I understand a fine course of ore has been discovered at the Bwlch United Mine, which has caused quite a sensation in the district of Goginan. At Bryn Glas they will soon be in a position to work in the rich stopes, and sink deeper on the course of the lode, which is estimated to be worth at least 40*l.* per fathom at the bottom of engine-shaft.

ENCOURAGEMENT.

REVIVAL OF CARDIGANSHIRE MINES.

SIR,—In no mines in this country has a greater change for the better occurred within the last three months than in those of this county, as will be seen from the following remarks concerning them:—The great and I may say vast discovery of rich copper ore at the Cambrian Mines still continues, and is getting richer as depth is being attained. Such a body of ore has not been discovered during the last half century. Whatever returns they may be making must not be taken as a criterion of what returns they are capable of making, and I have no doubt will soon make. They are, simply speaking, enormous, and are well deserving the title of Mines of Wealth. The great discovery at South Cambrian Mine also still holds good in driving the deep adit level east. They have passed over 80 fms. of good paying ground for blende, 10 fms. of rich ground for silver-lead ore, and for the last 5 fms. have opened in the part of the lode carrying (4 ft.) a course of malachite, 2 ft. wide, which will yield a percentage of 50 as broken down. The machinery will be completed in two months, and large returns and profits commence. The Cam Dwr Mawr has made exceedingly rich discoveries of lead ore near the surface, and only wants machinery to make it a lasting profitable mine. The Nant-y-Moch in this district, and on the East Darren lode, is registered with a capital of 10,000*l.*, which is ample for all purposes, and is likely from the appearance of the vein at the 30 to make one of the greatest deposits ever discovered in Cardiganshire. The 1*l.* shares are being extensively taken by mining men in the immediate district, and work will commence on Dec. 1. East Darren has erected a large and powerful wheel, which will dispense with the great cost of a steam-engine hitherto used, and the prospects are greatly improved. At New Bronfloyd the richest course of ore ever discovered there has recently been cut into at the 73, on the new lode, and may be safely reckoned if properly worked to be capable of giving very large profits to the shareholders. South Darren has been opening out very rich courses of ore for a very great length of time, and it is not for want of rich ore ground being laid open if large profits are not realised.

The Cwm Erfin, with a very large compact and complete field of machinery, which have returned hundreds of thousands of pounds worth of ore, and is capable and will repeat the operation, has been standing idle in the midst and surrounded by the very best mines ever wrought in this county for some time past, but will stand in that position no longer, as I have purchased the mine and machinery for a party of gentlemen of sufficient influence to form a capital of 20,000*l.* to pay for purchase and to develop its riches. A few particulars which I should be happy to give to bona fide intending investors would rather amuse, astonish, and surprise them. At the Bwlch United a rich discovery has been made at the 100, and as this property will not reach the depth of the Goginan deep adit until it has been sunk 20 fms. deeper, or to the 120, it may be looked upon as a virgin treasure. I need not dilate on its prospects, as a full and special report of mine appeared in last week's Supplement to the *Mining Journal*. At Cwm Priff an exceedingly rich course of silver-lead ore has been found on two distinct lodes, and having nearly 100 fms. of backs to surface. The machinery, consisting of a new 40 ft. water wheel, 4 ft. 6 in. breast, a 30 in. diameter rolls crushing mill, with six compartments of plunger jiggers, equal to six complete jiggering hutchies, and slime dresser, are all contracted for, and returns and profits will commence in April next, and from the ore ground already laid open will increase for many years to come. A communication has been made from the adit to the 20, which is in a position, as soon as the water is drained, to be immediately pressed forward under a rich course of silver-lead ore worked over the adit for more than 100 fms. long. Grogwinion is an excellent mine, and Frongoch is capable of making large returns of both lead and blende.

Taking these facts alone into consideration, it is not too much to assume that in 1880 the produce of the mines of Cardiganshire will be fully double those of 1879 with the present miserable appliances for working. But should rock-drills, stone-breakers, and approved dressing machinery, and slime dressed on Nance's patent be applied, in two years the quantity now returned would be quadrupled, at an immense saving of cost, and increased dividends to the shareholders and royalty to the landed proprietors. It, therefore, behoves all these parties to look to their own interest if they feel inclined to be rewarded with what the mines are capable of yielding for them, for if they do not they may rest well assured of this—that the parties engaged in the mines here will not move from the old track. Nothing but necessity, which is the mother of invention, caused the Cornish shareholders to march from the old and beaten road, and nothing but shame or necessity will induce our Cardiganshire magnates to move from the present lethargic and, I may say truly, sickly, slovenly, and disgraceful way of working the mines of this county.

Aberystwith, Nov. 11.

ABASALOM FRANCIS.

[For remainder of Original Correspondence, see this day's Journal.]

EXTRAORDINARY FOLLY OF MINERS.—At the Hawarden Petty Sessions, last week, a number of miners were summoned for refusing to work in the Hawarden Company's collieries, near Chester, with safety-lamps, the ground of their refusal being that they could not earn as much with the safety-lamp as with the naked light. It was clearly proved at the time that gas had accumulated in the mine, and that four slight explosions had occurred. The Mines Regulation Act requires that in all such workings only safety-lamps shall be used.

paid on the debenture loan in this country. It would be a great advantage for the company if they could raise the money and clear away the mortgage. However, that was a matter entirely in the hands of the shareholders.

Mr. TAYLOR, in reply to a SHAREHOLDER, said the average yield of gold at Portarena had been 1 oz. 1 dw. 18 grs. per ton, and at the Val Topa 8 dw. 13 grs. On the motion of the CHAIRMAN, seconded by Mr. DONAGAN, the report and accounts were then received and adopted.

Mr. JOHN TAYLOR said that if the milling power could be increased it would increase the returns, whilst the general expenses would remain much the same. If that could be done, and payment of the present loan made, it would be a great advantage.

Mr. R. HENRIE TAYLOR then gave some particulars regarding the working and condition of different portions of the mine.

Mr. W. Fisher and Prof. Smith were then re-elected directors, the appointment of Lieut.-Col. Percival was confirmed, and Mr. Swaffield was reappointed auditor.

A vote of thanks to the Chairman and directors closed the proceedings.

THE ARUBA ISLAND GOLD MINING COMPANY.

A special general meeting of shareholders was held at the offices of the company, Gresham House, on Thursday. Mr. J. V. SMEDLEY (the chairman of the company) in the chair.

Mr. ARCHD. MACKENZIE (the secretary) read the notice calling the meeting.

The CHAIRMAN said: As you are aware, the sanction of this company is necessary to the transfer of the phosphate working agreement and concession. The concessionaire has made certain arrangements which the board consider are beneficial to this company. Several leading residents in the colony have offered their co-operation on the basis of forming a limited company in the colony to carry on the phosphate exploitation, and as much, if not all, the trouble between the Government and our company would have been avoided if the company's claims, moral and legal, had enjoyed the assistance of influential colonists. The board have gladly entertained the application of the concessionaire, and recommend it for your approval in place of the consent formerly given. The board have hopes that the proposed alliance may lead to the colonists also taking an interest in the development of our gold mining operations, and so render the company popular in the colony. The Chairman concluded by moving the resolution as follows:—

That the consent of the company be and is hereby given to Mr. C. B. Sewell assigning the phosphate contract between himself and the company, dated August 24, 1877 (subject to the company's interest therein), also a concession dated January 27, 1879, as modified and explained on July 24, 1879, to the Aruba Phosphate Mining Company.

Mr. ZOHRAH seconded the resolution, which was then put and carried.—The proceedings terminated with a vote of thanks to the Chairman.

THE NEW QUEBRADA COMPANY.

The following report of the directors will be presented to the shareholders at the meeting convened for Thursday, Nov. 27:—

OUTPUT OF ORE.—The directors informed you by circular, dated Sept. 8, that the output of ore from January to June of the current year amounted to 5197 tons, the quantity sent away by rail during the same period being 5855 tons, averaging approximately 13 per cent. of copper, dry assay. The output has since been further increased by the continuous extension of the workings, as shown by the monthly cards, and the directors anticipate the dispatch of about 7500 tons for the second half of the present year.

WORKINGS ON AROA LODGE.—The continuation of the workings has been attended with encouraging results. A new cross-cut has been driven from the northern extremity of the deep level to the eastern wall of the lode, which has opened up ore-fifth richer in value than that previously stopped from this portion of the mine. The same cross-cut is now being continued westward from the deep level towards the hanging wall, which has not yet been reached, although a distance of 72 ft. has been traversed. It is satisfactory to find that the width of the main body of mineral at this point is already shown to be more than double what it was, where the deep level originally intersected the lode. A winze is being sunk on the eastern wall to ventilate the cross-cut, on completion of which the deep level will be driven northwards on the lode. The stopes off Santa Barbara level, which were opened up some few months ago, have yielded large quantities of ore, averaging 15 per cent. dry assay, and promise to produce copper pyrites of a similar quality for some time to come. The works in the other parts of the mine have proceeded with regularity and without accident. The increasing production of mineral has necessitated the enlargement of the dressing floors, which are now arranged so as to admit of the treatment of abundant supplies of ordinary ore.

TITTIARA.—Explorations on a moderate scale have been carried on at this mine, where a fourth level has been discovered. The directors do not anticipate any immediate results, but the appearances are such as to warrant the belief that sooner or later it may prove a material adjunct to the present sources of mineral.

SAN ANTONIO.—There can be little doubt that the true site of this ancient and highly reputed lode or deposit has been discovered. The operations have as yet been almost entirely confined to clearing out the old level, which was broken into, and which is found to communicate with rather extensive workings. Ore bearing ground has also been found, and profitable stoping has been commenced, but the workings are so much choked with debris and mud that no definite opinion can yet be formed as to the value or extent of the discovery.

UTILISATION OF LOW GRADE ORES.—In addition to the present output of payable ore, the mines are capable of furnishing larger quantities of a lower percentage—say, from 7 to 8, dry assay. The utilisation of this mineral has for a long time been engaging the serious attention of the directors, and after a thorough examination of the various plans proposed, they have recently decided to make a trial of smelting on a moderate scale for the reduction of these ores to a rough regulus sufficiently rich to pay for shipment. A very convenient spot has been selected upon which to commence operations, where there is ample water power obtainable from the river for driving the necessary blast apparatus at a comparatively small cost. The outlay for plant will be relatively small, and from careful estimates which have been made the directors have every reason to anticipate favourable results. The necessary men and materials will leave for the mines at an early date.

CONTRACT WITH THE BOLIVAR RAILWAY COMPANY.—The contract between this company and the Bolivar Railway Company for the current year has worked satisfactorily, and the traffic has been conducted with regularity and efficiency. The Revenue account necessarily shows a deficiency for the first six months, the whole net proceeds of ore being credited to the railway company towards the guaranteed minimum. After the month of September, about which time this payment will have been completed, the net proceeds of the ore, less only the reduced traffic rate of 30s. per ton, will be retained by this company. The contract has been renewed for another year on substantially the same terms, but with the addition of needful provisions incidental to the carriage of smelting materials, fuel, &c., and of regulus.

GENERAL REMARKS.—The works generally are being prosecuted with vigour, and it appears that the output of ore for direct export can be fully maintained without making any reduction for the regulus which will be made on the spot. The operations are conducted with a view to the maintenance of adequate reserves. The timber and dye woods on the estate are likely to aid the revenue accounts of ensuing years. Some small shipments have resulted profitably, and this business is being extended. The health of the staff generally has been good, and the services of the superintendent and officers all that could be desired.

LEVANT.—The accounts presented at the meeting of adventurers showed a profit on the 16 weeks working of 241l. 13s., reducing the debit balance to 1643l. 7s. Capt. Trezise and White reported that the total number employed on tutwork and tribute are 158 men and 26 boys. They have raised during the last 16 weeks about 90 tons of tin, and 820l. worth of copper. The price of tin and copper having advanced considerably since the last account, they are of opinion that some steps should be taken to get a rock-drill to work in the 278 fathom level, in order to expedite the work of driving towards the north lode and the south lode. The north lode has been and still is the most productive lode in the mine. They have much pleasure in calling the attention of the adventurers to the piece of ground now idle in the eastern part of the mine. They believe it to be the best piece of ground now idle in the neighbourhood. It was resolved to introduce the rock-drill at once, the chairman (Mr. Richard Boyns) stating that it would take four years to drive out to the level by hand labour, whilst they hoped to do it in 18 months with a rock-drill. With regard to the piece of idle ground mentioned in the agent's report, as it would require a steam-engine to properly work it, the committee did not think they were in a position at present to recommend the meeting that it should be worked, as well as recommending that a rock-drill should be had. The matter was left in abeyance, and it was determined to dispose of the relinquished shares at the discretion of the committee.

NORTH LEVANT.—In forwarding to the shareholders the accounts passed at the recent meeting, the purser—Mr. R. Boyns—remarks that it is a great pleasure once more to show a profit, however small. The prospects of the mine continue to improve, and the price of tin has advanced rapidly, so that at length there is reason to believe that those adventurers who have so long and so pluckily stuck to this and other Cornish mines will really receive the reward they so well deserve. The accounts showed a profit on the 16 weeks of 58l. 7s. 3d. Capt. Bennett remarked that the mine had improved a little before the last meeting, and then it was said, provided the improvement was maintained, they would return enough tin to pay costs. Aided by the improved price of tin they had accomplished this and a little more. All were aware that a mine could not be opened up extensively in three months with from 62 to 72 a fathom paid for opening up ground, and their reserves were not very much as yet, but if their lodes continued as at present they would eventually open up a pretty little mine. Mr. Boyns congratulated the adventurers that as theirs was the last mine to enter the list of mines making a call in the district they determined to be the first to give up the practice, and they had been able to abandon the collection of the second instalment of the call last made. They would do their best to show that it was not required. The mine they were opening was absolutely a new mine, and they had struggled hard to find it, and found it at last in virgin ground. As to the price of tin, he believed the rise was a genuine one, although it had been a very fast one, and the little fluctuations that had taken place had only gone to show the permanent stability of the advance. Last week's flutter was the result of 1000 tons being thrown on the market, and that it was absorbed so early and with so little change was a most gratifying sign.

[For the remainder of Meetings, see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

A recent adjudication of 12,000 tons of steel rails required for the Belgian State Railways has not been officially approved by the Belgian Minister of Public Works. In September the Belgian Government could have obtained these rails from Belgian firms at 6l. 4s. per ton, but when a second adjudication took place on "open" principles a few weeks since, the tenders were about 8s. per ton higher, and the Minister of Public Works considered them so excessive that he declined to accept them. The direction of the Great Central Belgian Railway has adopted an altogether contrary policy. It has concluded a contract with the Angleur Steelworks Company for all the steel rails which it requires until 1881. The Brussels Metallurgical Bourse has exhibited a very firm tone; the proprietors of rolling mills show a considerable disinclination to accept engagements with deliveries at fixed dates. Contracts are about to be let for the Belgian State Railways for 70 small trucks and nine boilers for locomotives. The buildings for the national exhibition to be held at Brussels in 1880 are making good progress, and everything points to the conclusion that they will be ready at the proper time. The Belgian General Waterpipes Company does not appear to have realised any profits in 1878-9.

Reports with regard to the Belgian coal trade are somewhat contradictory; but, upon the whole, the improvement recently noted appears to be sustained. Deliveries are in full swing. Winter is close at hand, and consumers are profiting from the few fine days which still remain to them to lay in supplies. The report of the Council of Administration of the United Collieries Company of the Charleroi Basin states that the profits of 1878-9 amounted to 15,748l., from which must be deducted 4800l. for interest on the loan of 1875. The net profit realised for the past year was thus 10,948l. A balance of undivided profits (5066l.) was brought forward from 1877-8; and with the help of this balance the Council of Administration was enabled to propose a dividend of 8s. per share for 1878-9. This dividend absorbed 12,000l. The company can now turn out 3000 tons of coal per day, besides 700 tons of briquettes.

The condition of the Paris coal market is tolerably satisfactory. In consequence of the cold weather which has prevailed stocks have been attacked; and now, in view of a winter which appears likely to be rather severe, the warehouses find it necessary to keep up their supplies. Coal for industrial purposes is beginning to show some activity, and has experienced an advance which ranges between 10d. and 1s. 8d. per ton, according to quality. In the Nord and the Pas-de-Calais coal has been selling freely, and prices have exhibited an upward tendency. So active at present is the movement of coal in the North of France that rolling-stock is becoming scarce on the railways. A good deal of business has also been passing in the coal basins of the centre of France.

The Westphalian coalowners have decided not only to reduce the extraction 5 per cent., but also to advance the prices of all qualities of coal 15 per cent. This advance took effect as from Nov. 7. The Upper Italy Railway Company has ordered three goods locomotives from the house of Herschell, of Cassel, and two other locomotives from the house of Ansaldo, of San Pier d'Arena (Genoa). The South of Charleroi Blast Furnaces Company sustained a loss of 14,832l. on its trading for the year ending June 30, 1879.

In the Haute-Marne the tone of the market is good; enquiries are not by any means wanting, and the great houses show themselves disposed to do business. The foundries are pretty well off for orders for girders, railway matériel, stores, &c. In the Meurthe-et-Moselle pig has maintained a good tone. Some important contracts have been negotiated as well for refining as for casting pig. Prices have been brought to nearly the same level as well in the Nancy as in the Longwy groups. No. 3 pig, for second fusion, is quoted currently at 2l. 17s. 8d. to 2l. 18s. 6d. per ton. In the Loire-et-Rhône orders have come to hand tolerably regularly, but they have been of no great importance. The Fives-Lille Company has fixed the dividend upon its share capital for 1880 at 1l. 4s. per share. Of this dividend 16s. per share has been distributed this month, and the remaining 8s. per share will be distributed on May 1, 1880.

FOREIGN MINES.

PLACERVILLE.—I. Thomas, Oct. 20: During the past two weeks the fifth level has been driven north 5 feet, making a total length of 71 feet. The winze from the fourth level has been sunk 9 feet, making a total depth of 49 feet. The cross-cut to connect with the second level has been driven 10 ft. Extracting ore.

SENTEIN.—Nov. 8: The managers report as follows:—The lode in No. 4 level end, driving west from cross-cut, is yielding saving work for silver-lead and blende of low quality. We expect to meet with the run or shoot of lead gone down in the bottom of No. 3 level soon. The lode in the present end (No. 4) is hard and spare for progress; we have driven this week about 1 metre. The lode in this level, driving east from cross-cut, is 7 ft. wide, and works fully 5 tons of silver-lead and 6 tons of blende per fathom for the width of lode. The lode in the stopes in back of this level is worth 4 tons of silver-lead and 7 tons of blende per fathom. The lode in the bottom of No. 3 level, east and west from winze, in the stopes is worth in each 4 tons of silver-lead and about 6 tons of blende per fm. The cross-cut driving north in No. 5 level is extended about 3 metres towards the lode; the ground here is a little easier for driving. There are some small strings of copper and sulphur-mundic in the end, so we think we are getting near the lode. We have broken about 100 tons of mineral during the week. We should have broken a great deal more, but several of the miners have been engaged putting in timber and securing the ground in the stopes in the bottom of the No. 3 level. We hope next week to be able to raise a much larger quantity. We have brought down from the mine this week about 123 tons of mineral. We have dressed during the past week 28 tons of best lead, and 1 ton of second lead—total, 29 tons; also about 45 tons of blende, making in all 72 tons. We are pushing on the erection of the racks to dress the slimes as fast as we possibly can. All the machinery is in good order, and working well. The following is a report of the engineer engaged in erecting the wire-rope:—Since my last report of October 11 the following progress has been made with the works of the wire-rope inclines:—The wood frame for brake gear at Nos. 1, 2, and 3, and at No. 4 will be completed in its place to-morrow. No. 5 is completed and will be sent up shortly to be fixed in place. There have been 3400 yards of rope laid out, and several coils have been sent up ready for laying out when necessary. The splicers have arrived, and are busy splicing the ends of the ropes together. The two first sections of the incline will be joined up to-day—that is, the rope from No. 1 to No. 3 will be all joined up by this afternoon. A large quantity of brake gear, blocks, chains, &c., has been sent up to the mountain, and I hope to send more up shortly. The weather has been very favourable, on the whole, and the transport arrangements very efficient.

LIXARES.—Oct. 29: In the 115, east of Warne's, the lode is large, but the part opened is of little value. The lode in the 115, west of Warne's, is disarranged and unproductive. In the 135, west of Peil's, the lode is regular and moderately productive, worth 1 ton per fathom. The lode in the 120, west of Peil's, contains stones of ore, but not enough to value. The 105, west of Peil's, is laying open a good length of valuable lode, worth 1½ ton per fathom. The 135, east of Peil's, is not turning out so well as expected; valued at 1 ton per fathom. In the 120, east of Peil's, the lode has fallen off in value in the past fortnight, but still worth 1 ton per fathom. The 105, east of San Francisco, continues to open up valuable ore ground, yielding 1½ ton per fathom. No. 232 winze, below the 105, is being sunk through a very fine lode, worth 2 tons per fathom. The lode in No. 233 winze, below the 120, has changed unfavourably since last report, now producing 1 ton per fathom. The returns of ore were kept up very regularly during the past month, and the stopes in that time have not undergone any change of importance. The various works at surface are going on satisfactorily, and the machinery is in good condition. We estimate the raisings for November (five weeks) at 250 tons.—Quintientos Mine: In the 100, east of Taylor's, there is an irregular lode, with occasional stones of ore. In the 90, east of Taylor's, a great length of valuable lode was driven through in the past month, worth 2 tons per fathom. In the 80, east of San Carlos, there is a promising lode, consisting chiefly of calcareous spar and stones of ore, valued at ½ ton per fm. The lode in the 80, east of boundary, is small, but opening paying ground, yielding ½ ton per fathom. In the 50, east of boundary, there is a compact and well defined lode, producing 2 tons per fathom. We estimate the raisings for November at 75 tons.

FORTUNA.—Oct. 29: In the 120, west of O'Shea's, there is a very kindly lode, which is producing fine stones of ore, valued at 1 ton per fathom. The lode in the 50, west of Abercrombie's, is larger than for some time past, but does not contain ore enough to value. The 60, west of Abercrombie's, is again improving, and yields very good lump ore; worth ½ ton per fathom. In the 70, west of San Pedro, there is a compact and well-defined lode, yielding 1 ton per fathom. The lode in the 80, west of San Pedro's, is large, with good spots of ore disseminated throughout, valued at ½ ton per fathom. From the 80, east of San Pedro, the main part of the lode has not been met with in driving south. In the 70 fathom level, east of San Pedro, the lode has increased in size and value, and looks promising; worth 1 ton per fathom. The lode in the 120, west of O'Shea's, is large, intermixed with granite, quartz, and spots of lead ore. In the 100, east of Lowndes's, the lode is split, and consequently of less value than when last reported; valued at ½ ton per fathom. The lode in the 90, east of O'Shea's, has been very regular in the driving for some time. Luis's winze sinking below the 40 is improving in value, and the ground is easier, producing ¾ ton per fathom. Peil's winze below the 50 is laying open very good stopping ground; worth 1 ton per fathom.—Los Salidos: The lode in the 160, west of Taylor's, has slightly decreased in value; it is now worth ½ ton per fm. The ground is harder. In the 160, east of Taylor's, the lode and ground are disordered, and consequently valueless. The lode in the 145, east of Taylor's, is large and strong, and thickly impregnated with lead ore; valued at ¾ ton per fathom. In the 130, east of Taylor's, the lode is improving, and the ground easy for driving, producing 1 ton per fathom. The 120, east of San Pablo's, is being driven through a very fine lode of ore ground, yielding 1 ton per fathom. In the 110, east of San Miguel, the lode is small and poor, and the ground very

hard. From the 80, west of Palgrave's, no lode has been met with yet in cross-cutting south. The lode in the 80, east of Palgrave's, is large, and yields very good stones of ore; valued at ½ ton per fathom. In Taylor's engine-shaft, below the 160, fair progress is being made with the sinking; the lode is improving in value, nor worth 1½ ton per fathom. Herbert's winze, below the 110, is opening splendid stopping ground; valued at 2½ tons per fathom.

ALAMILLOS.—Oct. 29: In the 20, west of San Felipe, the lode is small, and easy for driving; yielding 1 ton per fathom. The lode in the 100, east of Taylor's, is large and regular, but quite destitute of ore. In the 115, west of Taylor's, the lode fell off in the past week, but is again improving; now yielding 1½ ton per fathom. The lode in the 100, west of Taylor's, continues unproductive. In the 85 fm. level, west of San Adriano's, the lode is regular, with good stones of ore. The lode in the 60, east of San Victor, has somewhat improved, and yields good stones of ore in the upper part of the end. In the 70, east of San Victor, there is no improvement in this driving. In the 70, west of San Victor, fairly productive ore ground is being opened up, valued at 1 ton per fathom. The 50, east of Judd's, is disarranged by cross-joints. In the 70, west of Judd's, there is a small vein in the driving, but it is of no actual value. The lode in Mirino's winze below the 40 has failed. The weekly weighings of ore were maintained very regularly in the past month, during which time the stopes did not undergo any change of importance. The ordinary surface work is kept on steadily, and the machinery is in good working order. We estimate the raisings for November at 200 tons.

BUENA VENTURA.—Oct. 29: In the 25, east of No. 1 shaft, a good length of fairly productive lode was opened up at a cheap rate in the past month, valued at 1 ton per fathom. The lode in the 25, west of No. 2 shaft, is very easy for driving through, but at present without ore. In the No. 1 shaft below the 25, a very good lode was sunk through during the greater part of the month, but it fell off a few days since, and now worth ½ ton per fathom. The lode in the No. 1 winze below the 10 is improving, and yielding good stones of ore. The surface works are going on steadily. The compound engine in the Feliza sett was started on the 18th, and works very well. The rate of drainage, considering the great extent of excavations, is satisfactory. In the Emma sett, having sunk the old shaft several metres (below the old works) in sound ground to prove the dip and bearing of the lode, the men will now begin at the surface to enlarge and carry it down the proper size to receive pitwork, &c. In the eastern mine, where we are making a small dressing floor to clean and return some mineral already broken.

SAFETY FUSE TRIALS.—An account has already been given of the rock-boring competition at Wheal Agar, in connection with the Mining Institute exhibition. After that competition a very interesting practical exhibition took place of the recent improvements and inventions effected by Messrs. Bickford, Smith, and Co., of Tuckingmill, in their patent safety and other fuses. The first test was that of one of Bickford's patent igniters. This appliance consists of a little instrument devised so as to contain an ordinary safety-fuse at one end and at the other a set of instantaneous fuses, which may be of any number from four to sixteen, representing the number of holes required to be blasted. Between the end of the safety-fuse and the ends of the instantaneous fuses is inserted an explosive disc, the action of which is such that on the communication of fire from the safety-fuse the whole of the instantaneous fuses are immediately ignited. The igniter tested on the present occasion contained eight instantaneous fuses, representing an average number which would be required in ordinary mining, and the simultaneous effect of the ignition was at once seen and considered satisfactory. On commencing to show a second similar set it was suggested by one of the gentlemen present that detonating caps be attached to the ends of the instantaneous fuses, so as to enable the company better to judge of the absolutely instantaneous discharge of the quick fuses. Caps were attached to the instantaneous fuses, and the safety-fuse having been ignited as before, one single report caused by the explosion of the eight detonators soon followed, showing that the eight fuses had been ignited and conveyed their fire with practical instantaneity. It was stated that this new fuse had been proved to burn at the rate of 100 ft. per second, and there next followed an interesting experiment tending to show that this, or at least, an exceedingly rapid rate of combustion was obtained with this fuse. A length of 60 ft. was spread out on the ground and fired by means of the safety-fuse at one end. On the fire reaching the instantaneous fuse the combustion of its whole length immediately followed, scarcely any perceptible time, certainly not a second, being occupied. It was explained that the practical object of this fuse and the patent igniter was to provide cheaper and much simpler means of simultaneously firing several holes than has hitherto been provided only by means of electricity, and the results of the above experiments went far to show that the result had been attained. Specimens of Messrs. Bickford's ribbon metallic fuse and pyroxyline fuse, the latter containing no gunpowder, and giving off a minimum of smoke, were also burned. The experiments were watched by Dr. Le Neve Foster, Mr. J. H. Collins, Capt. Rich, Capt. F. Gilbert, and many other mine agents and gentlemen, and were personally conducted by Mr. George J. Smith, of the firm of Bickford, Smith, and Co.—West Briton.

HOLLOWAY'S OINTMENT AND PILLS.—Diseases of the most formidable and chronic characters have been cured by Holloway's remedies. Ulcerations which have proved themselves incurable by any other known means have healed kindly under the purifying and regenerating influence of this excellent ointment. Sprains, stiff joints, contracted muscles, and glandular swellings can be most safely and effectually healed by Holloway's ointment and pills, which can do no harm under any circumstances. Neither of these medicines has anything deleterious in its composition; both are essentially purifying and strengthening in their nature. The combined power of these noble remedies enables them successfully to cope with most descriptions of impurities, and to cure, or at least relieve, most varieties of diseases.

COPPER ORES.

Sampled Oct. 22, and sold at Tab's Hotel, Redruth, Nov. 6.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Mellanoar.....	82	£4 0 0	Levant.....	65	£6 9 0
ditto.....	80	3 17 6	ditto.....	55	6 19 0
ditto.....	79	3 15 6	West Seton.....	2	36 12 0
ditto.....	72	3 8 0	ditto.....	53	5 1 6
ditto.....	65	3 8 0	ditto.....	23	5 3 0
ditto.....	64	3 13 6	ditto.....	2	15 10 0
ditto.....	63	3 2 0	East Pool.....	40	2 19 6
ditto.....	52	3 2 0	ditto.....	39	2 19 6
ditto.....	36	10 9 6	Wheal Owles.....	66	1 7 0
West Tolgus.....	77	5 0 0	North Treskerby.....	53	4 5 0
ditto.....	70	6 3 6	Botallack.....	40	5 10 0
ditto.....	60	7 1 6			
ditto.....	45	6 7 6			

TOTAL PRODUCE.

Mellanoar.....	593	£2334 12 6	East Pool.....	79	£235 0 6
West Tolgus.....	252	1528 12 6	Wheal Owles.....	66	89 2 0
Levant.....	122	874 14 0	North Treskerby.....	53	225 5 0
West Seton.....	103	540 6 0	Botallack.....	40	220 0 0

Average standard.....£94 1 0 | Average produce.....£4 12 6
Quantity of ore.....1305 tons | Quantity of fine copper, 102 tons 11 cwt.

LAST SALE.—Average standard.....£94 1 0 | Average produce.....£4 12 6
Standard of corresponding sale last month, £88 9 0 | Produce, 7½

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Vivian and Sons.....	623½	£2405 1 3
Grenfell and Sons.....	90½	435 12 9
Nevill, Druse, and Co.....	188	897 9 6
Williams, Foster, and Co.....	243	1818 7 0
Charles Lambert.....	178	690 12 0
Total.....	1308	£6047 12 6

NO SALE on Thursday next, November 13.

Copper Ores for sale on Thursday week, at the Royal Hotel, Truro—Mines and parcels.—Devon Great Consols 885—South Caradon 430—Gunnislake (Clitters) 320—Marke Valley 220—Glasgow Caradon 160—Bedford United 64=2079 tons.

COPPER ORES.

Sampled Oct. 22, and sold at Swansea, Nov. 4.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Betta Cove.....	135	7	£4 11 0	Caveira.....	70	8½	£4 17 6
ditto.....	135	7	4 11 0	ditto.....	70	8½	4 17 6
ditto.....	115	7	4 7 0	Berehaven.....	132	8½	5 13 0
ditto.....	115	7	4 7 0	ditto.....	22	17½	11 12 0
ditto.....	115	7	4 7 0	ditto.....	12	22½	15 0 6
ditto.....	115	7	4 1 8 0	ditto.....	7	11½	7 9 0
ditto.....	115	7	4 1 8 0	Cuba Precipit.....	12	40½	26 3 0
Caveira.....	88	8½	5 6 0	Italian Ore.....	8	26½	16 8 0
ditto.....	83	8½	5 6 0	Copper Pre.....	1	50½	31 16 0
ditto.....	82	8½	5 7 6	Copper Ore.....	2	16½	9 1 0
ditto.....	82	8½	5 7 6	ditto.....	1	26½	16 10 0
ditto.....	70	8½	4 17 6				

TOTAL PRODUCE.

Betta Cove.....	960	£4250 2 6	Cuba Precipitate.....	12	£213 16 0
Caveira.....	540	2785 1 0	Italian Ore.....	8	131 4 0
Berehaven.....	154	906 19 0	Copper Precipitate.....	1	31 16 0
Cambrian.....	50	532 1 0	Copper Ore.....	3	34 12 0

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Copper Miners' Company.....	271½	£1220 9 0
F. Grenfell and Sons.....	58½	288 4 9
Nevill, Druse, and Co.....	517	2480 8 0
Vivian and Sons.....	546½	2,685 13 9
Mason and Elkington.....	124½	659 17 0
Sweetland and Co.....	57½	250 2 6
Landore Copper Company.....	140½	1,169 2 6
Total.....	1728	£9,045 11 6

NO SALE on Nov. 18.

TOTALS AND AVERAGES.

Whole sale.....	1728	£94 1 0	Produce.....	128	£4 8 8	Standard.....	£87 19 8
-----------------	------	---------	--------------	-----	--------	---------------	----------

THE BIRMINGHAM RAILWAY CARRIAGE AND WAGON COMPANY

(LIMITED)
MANUFACTURE RAILWAY CARRIAGES AND WAGONS OF EVERY DESCRIPTION, FOR HIRE OR SALE, BY IMMEDIATE OR DEFERRED PAYMENTS. They have also WAGONS FOR HIRE capable of carrying 6, 8, and 10 tons, part of which are constructed specially for shipping purposes. Wagons in working order maintained by contract.

MANUFACTURERS also of IRONWORK, WHEELS, and AXLES.
EDMUND FOWLER, Managing Director.
WORKS, SMETHWICK, BIRMINGHAM.

BICKFORD'S PATENT
FOR CONVEYING
CHARGE IN



SAFETY FUSE
FIRE TO THE
BLASTING ROCKS, &c.

Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1851; at the "INTERNATIONAL EXHIBITION" of 1862 and 1874, in London; at the "IMPERIAL EXPOSITION," held in Paris in 1855; at the "INTERNATIONAL EXHIBITION," in Dublin, 1865; at the "UNIVERSAL EXPOSITION," in Paris, 1867; at the "GREAT INDUSTRIAL EXHIBITION," at Atlanta, in 1876; TWO MEDALS at the "UNIVERSAL EXHIBITION," Vienna, in 1873; and at the "EXPOSITION NACIONAL ARGENTINA," Cordova, South America, 1872.



BICKFORD, SMITH, AND CO.,
OF TUCKINGMILL, CORNWALL; ADELPHI BANK CHAMBERS, SOUTH JOHN STREET, LIVERPOOL; and 55, GRACECHURCH STREET, LONDON, E.C., MANUFACTURERS AND ORIGINAL PATENTEES OF SAFETY FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—
EVERY COIL OF FUSE MANUFACTURED by them has TWO SEPARATE THREADS PASSING THROUGH THE COLUMN OF GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as THEIR TRADE MARK.

BENNETTS' SAFETY FUSE WORKS,
ROSEKAR, CAMBORNE, CORNWALL.

BLASTING FUSE FOR MINING AND ENGINEERING PURPOSES

Suitable for Wet or Dry Ground, and effective in Tropical or Polar Climates.

W. BENNETTS, having had many years' experience as Chief Engineer with Messrs. Bickford, Smith, and Co., is now enabled to offer Fuse of every variety of his own manufacture, of best quality, and at moderate prices.
Price Lists and Sample Cards may be had on application at the above address.
LONDON OFFICE—H. HUGHES, Esq., 55, GRACECHURCH STREET.

Published in ONE VOLUME, 8vo., price 31s. 6d., half-bound in calf, pp. 450

THE ENGINEERS' VALUING ASSISTANT:

A PRACTICAL TREATISE ON THE
VALUATION OF COLLIERIES AND OTHER MINES,
Including Royalties, Leaseholds, and Freeholds, and Annuities from other sources, with Rules, Formulae, and Examples; also,
NEW SETS OF VALUATION TABLES,

Calculated on the principle of allowing interest to the purchaser of annuities at one rate, and redeeming the capital invested at another, and practicable rate per cent.; and
TABLES OF VALUES,

Showing the discrepancies existing in the ordinary tables of present values, and the errors created by their use.

SOURCES FOR THE REDEMPTION OF CAPITAL

At different rates per cent.

REMARKS UPON HOME AND FOREIGN MINES

As Investments, &c., by

H. D. HOSKOLD, F.R.G.S., F.G.S., M.Soc.A. and Inst.M.E., &c.,

CIVIL AND MINING ENGINEER,

Author of "A Practical Treatise on Mining, Land, and Railway Surveying and Engineering," with INTRODUCTORY NOTE by

PETER GRAY, F.R.A.S.,

Member of the Institute of Actuaries; Author of "Tables and Formulae for the Computation of Life Contingencies, &c."

Orders for Copies received at the MINING JOURNAL Office.

OPINIONS OF THE PRESS.

"With these tables by his side the mining engineer entrusted with a valuation, having first taken care to secure accurate data to work upon, can make his estimate with the greatest facility and with the utmost possible confidence that the valuation will be reliable and satisfactory. The tables will, no doubt, be extensively used by mining engineers, and the use of them cannot fail to economise time to an important extent. The book is very well produced, and, as a whole, is well written, in a clear and concise manner. Being the first published work on the valuation of mines, it will undoubtedly form a standard text-book upon a subject the author was well qualified to take up. We heartily commend it to the notice of our readers."

"In conclusion, we may say that Mr. Hoskold's book contains matter of great interest to both the professional valuer and the actuary. It is supplied with that great recommendation, a really first class index, and should be in the hands of all interested in its subject."

"The great amount of labour involved in the construction of the tables which are contained in this book can only be fully appreciated, as Mr. Peter Gray remarks in an introductory note to Mr. Hoskold's work, by those who have had some experience in a similar task. The main improvement effected by Mr. Hoskold in the preparation of tabular aids to the valuer is that while in the common tables of present values which give the prices at which annuities may be bought or sold at par, no account is taken of the disparity between the rates allowed and those at which money can in point of fact be invested, every practical combination of rates is taken into account in the present work. It is of too technical a nature to receive a detailed notice at our hands, but it bids fair to become the acknowledged text-book of the valuer, not of mining property alone, but of various descriptions of deferred or limited incomes, the proper price of which is only to be ascertained by the aid of the actuary, or, as in the present case, of the valuing engineer. The book, being exclusively one of reference, is very sensibly issued, half bound in calf. It forms an important addition to the library of the financier, as well as to that of the mining surveyor, and the time saved by its use will soon pay the price of the book."

"In these days of commercial enterprise it is important that the comparative values of mineral and other kinds of property should be determined with some approach to accuracy, and that rules of a reliable kind, based on scientific principles, should take the place of approximations. Mr. H. D. Hoskold, F.G.S., the civil and mining engineer, had just published a comprehensive work that will meet the want; and the author's experience in valuing coal and other mines will add materially to the authenticity of the tables given. . . . We have much pleasure in recommending Mr. Hoskold's treatise to all surveyors and actuaries as being one of the most complete and scientific expositions of a subject of such every day importance."

"The value and originality of Mr. Hoskold's laborious work are pointed out on the high authority of Mr. Peter Gray, the well known actuary, who contributes an introduction."

"It is certainly a book that ought to be in the hands of all engineers."

"We recently announced the approaching publication of this work, and expressed a favourable opinion of its author, and intimated our confidence in its merits. On examination we find that its elaborate completeness and general usefulness more than justify the opinion then expressed. The work will become a standard of reference, the worth of which must constantly increase, and the real national importance of which will sooner or later be expressed in terms not to be mistaken."

"That section of the engineering profession which devotes itself to the intricate operations of mining owes gratitude to Mr. Hoskold for this laborious and useful work. . . . That it will be found a hard working book for hard working people by many of our readers we have not the smallest doubt, and congratulate Mr. Hoskold on the success of his painstaking."

"This is a work of stupendous labour. For years the want of a standard book on mine valuation has been felt, and Mr. Hoskold has met that want in a manner that none other could have, and has won the thanks not only of living engineers, but of those of generations far in the future."

"The book is well printed, and is bound for use, which it will surely have in the office of mine valuers and actuaries."

Now ready, price 3s., by post 3s. 3d., Sixth Edition; Twentieth Thousand Copy, much improved, and enlarged to nearly 300 pages.

HOPKINSON'S CONVERSATIONS ON MINES, between Father and Son. The additions to the work are near 80 pages of useful information, principally questions and answers, with a view to assist applicants intending to pass an examination as mine managers, together with tables, rules of measurement, and other information on the moving and propelling power of ventilation, a subject which has caused so much controversy.

The following few testimonials, out of hundreds in Mr. Hopkinson's possession, speak to the value of the work:—

"The book cannot fail to be well received by all connected with collieries."—*Mining Journal*

"The contents are really valuable to the miners of this country"—*Miners' Conference*.

London: MINING JOURNAL Office, 26 Fleet-street, E.C., and to be had of all booksellers.

FIRST PRIZE MEDAL,

ROYAL CORNWALL POLYTECHNIC SOCIETY, 1878.

Rate of Drilling, three to four times as fast.

as hand labour.

Prices complete, £55 to £70.
HAND POWER Rock DRILL.

SPECIALITIES—
PATENT PNEUMATIC
HAND & STEAM POWER
STAMPS, CRUSHING ROLLS,
PATENT PROSPECTING PLANT, &c.
T. B. JORDAN, SON, AND MEIHEM,
ENGINEERS AND CONTRACTORS,
63, QUEEN VICTORIA STREET, LONDON, E.C.,
AND AT
21 AND 22, LINDENSTRASSE, BERLIN, S.W.

SOLID DRAWN BRASS AND COPPER BOILER TUBES,

FOR LOCOMOTIVE OR MARINE BOILERS,
EITHER

MUNTZ'S OR GREEN'S PROCESS.

MUNTZ'S METAL COMPANY (LIMITED),
FRENCH WALLS,
NEAR BIRMINGHAM.

PATENT DUPLEX LAMPS,

FOR COLLIERIES, IRONWORKS, &c.

SUITABLE FOR PIT BANKS, ENGINE HOUSES, &c., &c.



Each Lamp gives a light equal to 26 candles.
No Breakage of Chimneys from Heat.
Cottons last three months.
Will burn any Mineral Oil.

S. HOOPER,

LAMP MAKER & OIL MERCHANT
LOWER TEMPLE STREET,
BIRMINGHAM.

N.B.—Lamps made suitable for every purpose.

The BEST SIGNAL BELL MADE for MINING PURPOSES.

ILLUSTRATIONS ON APPLICATION.

READE BROTHERS,

TOWER VARNISH WORKS,

NECHELLS, BIRMINGHAM,

MANUFACTURERS OF

High-class Varnishes and Japan,

For COACH & RAILWAY WAGON BUILDERS,

ENGINE BUILDERS, CONTRACTORS, COLLIERY AND

GENERAL ENGINEERS,

LAMP MANUFACTURERS,

AGRICULTURAL IMPLEMENT MANUFACTURERS,

DECORATORS, &c.

Lists and Samples on application.

CALIFORNIAN AND EUROPEAN AGENCY.

209, LEIDESDORFF ST., SAN FRANCISCO, CALIFORNIA.

THIS AGENCY is prepared to make Investments in approved REAL ESTATE, MINING PROPERTIES, MINING STOCKS, &c., and to INVEST MONEY IN FIRST-CLASS SECURITIES IN CALIFORNIA, and the neighbouring States.

Also to AFFORD INFORMATION AND ADVICE to parties abroad who may contemplate or may have already invested in Enterprise on the Pacific Coast, and to take charge of Property, and to look after the interests of absentees.

EDWARD J. JACKSON, 209, Leidesdorff-street, San Francisco, Cal.

REFERENCES:—
Wm. Lane Booker, Esq., H. B. Majesty's Consul, S. F.; the Honorable Leland Stanford, Ex-Governor of California and President of the Central Pacific Railroad, S. F.; the Right Rev. Wm. Ingraham Kip, D.D., LL.D., Bishop of California; the Rev. William Vaux, Senior Chaplain U.S.A., Santa Cruz, Cal.; the Anglo-Californian Bank, San Francisco, California; the Anglo-Californian Bank, No. 2, Angel-court, Throgmorton-street, London, E.C.

GRAND EXPLOSIVE COMBINED WITH PERFECT SAFETY.
MINING MADE EASY—POWER without DANGER.

The Liverpool Cotton Powder and Ammunition Company's
SAFETY COTTON BLASTING POWDER

Is the SAFEST, STRONGEST, and most ECONOMICAL in WORKING of all EXPLOSIVES. The MINERS, AFTER a shot is fired, can IMMEDIATELY recommence work. Absolutely SAFE in TRANSIT by boat or rail. PAR EXCELLENCE in every description of MINING, QUARRYING, TUNNELLING, EXCAVATING and SUBMARINE operations. Entirely free from Nitroglycerine.

Offices: 39, OLD HALL STREET, LIVERPOOL. Works: MELLING, near LIVERPOOL.
AGENTS.—The Company have a few VACANCIES in the chief Mining Districts for really good and thoroughly PRACTICAL MEN. Apply to the Secretary, DAVID ANDERSON, personally, or by letter at the Offices of the Company.

WILLIAM EDWARDS AND SON,
Griffin Works, Wolverhampton,

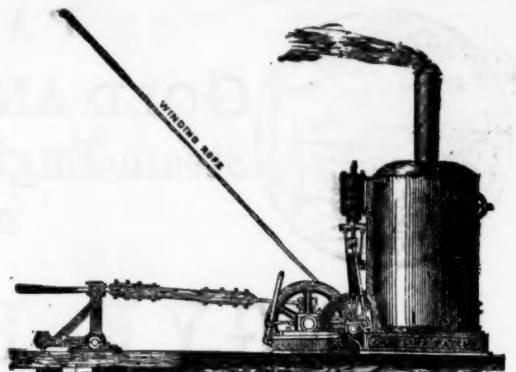
MANUFACTURERS OF

Edge Tools, Spades and Shovels. Hand, Sledge, Stone Quarry, and Mining Hammers, Railway Contractors' and Mining Tools. Axes, Adzes, Pickaxes, Crow and Boring Bars, Wrought-iron Wheelbarrows.

The Original and Only Manufacturers of Best Crown Quality of Horse Shoes

PATENTEES and MANUFACTURERS of PATENT PUNCHED EYE PICKAXES, HOES, HAMMERS, ADZES, and other TOOLS.
Under Patent No. 4698.

PRIZE MEDAL—INTERNATIONAL EXHIBITION.



CHAPLIN'S PATENT
PORTABLE STEAM ENGINES
FOR PUMPING AND WINDING.

SPECIALLY ADAPTED for PITS, QUARRIES, &c. SIMPLE and STRONG; require NO FOUNDATION or CHIMNEY STACK, and are EASILY ERECTED or REMOVED. Sizes, from 2 to 30-horse power.

Steam Cranes, 1½ to 30 tons, for railways, wharves, &c.; hoist, lower, and turn round in either direction by steam.

Stationary Engines, 1 to 30-horse power, with or without gearing.

Hoisting Engines, 2 to 30-horse power, with or without jib.

Contractors' Locomotives, 6 to 27-horse power.

Traction Engines, 6 to 27-horse power.

Ships' Engines, for winding, cooking, and distilling, passed by H.M. Government for half water.

Steam Winches. Engines and Boilers for light screw and paddle steamers.

WIMSHURST, HOLLOCK, & CO.,

ENGINEERS,

CITY OFFICES: 2, WALBROOK, LONDON, E.C.

WORKS: REGENT'S CANAL DOCK, 602, COMMERCIAL ROAD EAST, LONDON, E. [near Stepney Station.]



By a special method of preparation this leather is made solid, perfectly close in texture and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

HEPBURN AND GALE,

TANNERS AND CURRIERS,

LEATHER MILL BAND AND HOSE PIPE MANUFACTURERS,

LONG LANE, SOUTHWARK, LONDON.

Prize Medals, 1851, 1855, 1862, for MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

TO MINERS IN NORTH AMERICA.

CHEMICAL LABORATORY AND GENERAL MINING OFFICES.

J. S. PHILLIPS, M.E.,

702, CALIFORNIA STREET, SAN FRANCISCO,

EXAMINER OF MINES, MINERAL ASSAYER, &c.

Practical Instructions for Testing and Assaying, by Blowpipe, Chemicals, Crucible Scorifier, &c.

Author of the "Explorers', Miners', and Metallurgists' Companion," a practical work of 672 pages, with 81 illustrations. Price, second edition, \$10.50.

Inventor of the "WEE PET" Assaying Machine, which obtained a GOLD MEDAL at the San Francisco Mechanics Institute Fair of 1869. Price \$100.

Having had Thirty Years' experience (twenty in Cornwall and ten in U.S., America), offers his services to those requiring ADVICE on MINES or MINING, ENGINEERING, ASSAYING, SMELTING, MILLING, and CHEMICAL REDUCTION.

REFERENCES:—

In England—The London Mining Journal, and leading Cornishmen.

In California—The Mining and Scientific Press, and principal Miners.

MEXICO, NEW MEXICO, ARIZONA, UTAH, NEVADA AND CALIFORNIA.

F. M. F. CAZIN,

MINING AND CIVIL ENGINEER,

AT BERNALILLO, NEW MEXICO, U.S. OF AMERICA.

Has 24 years' experience in Mining and Smelting, and 10 years' experience in American Business and Law, offers his services at moderate charges for Reporting on Mining and other Property in any of the above-named States or Territories gives correct, safe, and responsible advice as to securing full titles and possession and, as to best mode of utilizing the property, will assist in settling existing difficulties by compromise, and in disposing of developed mining property when held at real value; offers his assistance for securing undeveloped mining properties at home prices. As to care taken in reporting, reference is made to the Mining Journal Supplement, April 1, 1876, containing a report on property of the Maxwell Land Grant and Railway Company; as to technical standing, to the prominent men of the trade—compare Mining Journal of Aug. 30 and Nov. 31, 1872, and New York Engineering and Mining Journal, Feb. 28, 1874.



PARIS EXHIBITION, 1878.
GOLD AND SILVER MEDALS AWARDED for
Steam-Engines & Boilers, also the Special Steam Pump,
and Compound Pumping Engine.

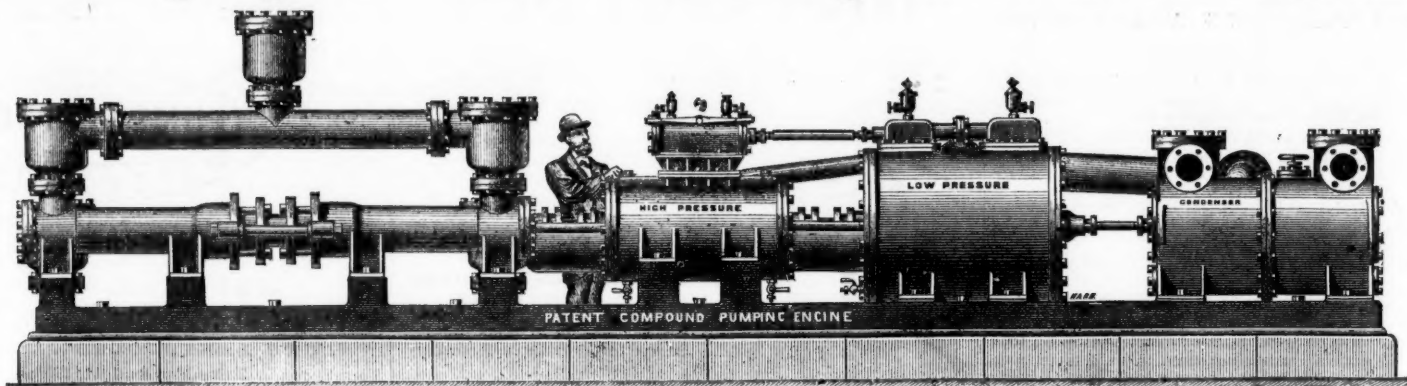


TANGYE BROTHERS AND HOLMAN,

CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE,

For use in Mines, Water Works, Sewage Works,
And all purposes where Economy of Fuel is essential.



TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE, WITH AIR-PUMP CONDENSER.

TANGYE'S COMPOUND PUMPING ENGINE COMBINES SIMPLICITY, CERTAINTY OF ACTION, GREAT ECONOMY
IN WORKING, COMPACTNESS, AND MODERATE FIRST COST.

This Engine will be found the most simple and economical appliance for Mine Draining, Town Water Supply, and General Purposes of Pumping ever introduced, and as regards Mine Draining, the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pitwork, are required, while they allow a clear shaft for hauling purposes. In this Engine the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere.

The following first-class Testimonials will bear evidence as to the efficiency and economy of the Engine :—

TESTIMONIALS OF TANGYE'S COMPOUND PUMPING ENGINE.

21" Newcastle and Gateshead Water Company, Newcastle-on-Tyne, Oct. 20, 1879.
36" x 10" x 48" COMPOUND CONDENSING STEAM PUMPING ENGINE.

Messrs. Tangye Brothers.

GENTLEMEN,—In reply to your enquiry as to the efficiency of the two pairs of Compound Condensing Engines recently erected by you for this company at our Gateshead Pumping Station, I have great pleasure in informing you that they have far surpassed my expectations, being capable of pumping 50 per cent. more water than the quantity contracted for; and by a series of experiments I find they work as economically as any other engine of the compound type, and will compare favourably with any other class of pumping engine. By the simplicity of their arrangement and superior workmanship they require very little attendance and repairs, and the pumps are quite noiseless. A short time ago I had them tried upon air by suddenly shutting off the column, and found they did not run away, thus showing the perfect controlling or governing power of the Floyd's Improved Steam-moved Reversing Valve. I will thank you to forward the other two pairs you have in hand for our Benwell Pumping Station.

(Signed)

Yours respectfully,
JOHN R. FORSTER, Engineer.

21"

36" x 12" x 48" DOUBLE RAM COMPOUND CONDENSING STEAM PUMPING ENGINES.

Messrs. Tangye Brothers.

Supplied in January, 1878.

GENTLEMEN,—Referring to the above, which we have now had working continuously night and day for the last 12 months, we are glad to say that it is giving us every satisfaction. It is fixed about 400 feet below the surface, the steam being taken down to it at pressure of 45 lbs. per square inch. We can work the pump without any difficulty at 28 strokes per minute—224 ft. piston speed. The pumping power is enormous. The vacuum in the condenser being from 11½ to 13 lbs. The pump is easily started, and works well and regularly. The amount of steam taken being much less than we anticipated. We consider the economy in working very satisfactory indeed. The desire for power and economy at the present day will certainly bring this pump into great requisition.

(Signed)

Yours truly,
M. STRAW, Manager.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder.....In.	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder.....In.	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke.....In.	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate.....	3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto ditto—with Holman's Condenser...	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

Diameter of High-pressure Cylinder.....In.	16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder.....In.	28	28	28	28	32	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder.....In.	8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke.....In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate.....	15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,050	35,225	47,950
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	360	230	160	118	456	202	202	149	397	276	202	518	360	264	562	
Ditto ditto ditto—with Holman's Condenser...	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937	

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

TWO GOLD MEDALS.



SOLE MAKERS—

The LEEDS FORGE CO., Ltd.,
Leeds, Yorkshire.

FOX'S PATENT CORRUGATED FURNACE FLUES,

NOW APPLIED TO OVER



PARIS, 1878.



PRICE LISTS AND
PARTICULARS
ON APPLICATION.

Awarded Gold Medal, Paris Exhibition, 1878.

HADFIELD'S STEEL FOUNDRY COMPANY.



FIRST PRIZE MEDALS AT LEEDS, MANCHESTER, AND
WREXHAM EXHIBITIONS, 1875 AND 1876.

ATTERCLIFFE, SHEFFIELD.

DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

CRUCIBLE STEEL CASTINGS,

FOR

Engineering & Mining Purposes,

AND ARE THE SOLE MAKERS OF

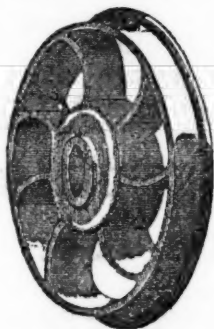


Hadfield's Self-oiling Steel Wheels

(PATENTED).

These possess advantages held by no other wheels, and are specially adapted for Collieries, Iron-ore Mines, Slate Quarries, Lead and Copper Mines, &c., &c., where LOOSE Wheels are used (i. e., those revolving upon their own axles). By the old system of lubricating loose wheels, it is well known this is attended with constant labour and excessive waste; and as so little of the grease or oil applied reaches the wearing surfaces, and as re-greasing can only take place at fixed parts of the workings, the bosses of the wheels and bearings of the axles soon become dry, and cut each other: thus causing enormous wear and tear, and necessitating extra labour, haulage power, and expense. These and numerous other defects are entirely remedied by these wheels, as will be readily seen from the following illustrations and advantages claimed.

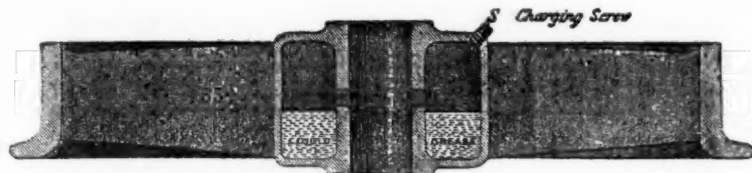
N.B.—Price per set of Wheels and Axles (ready for use) forwarded on receipt of—1. Diameter of Wheel on tread. 2. Width of tread. 3. Diameter and total length of axle, also whether No. 74 or 75. 4. Rail gauge. 5. Rolling load.



55+



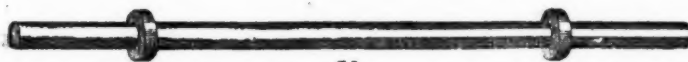
66+ Registered



Section



74



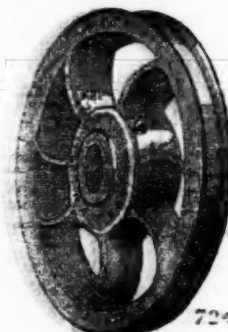
75



54+



34+



72+



35+

This Advancement is varied from time to time.

The following are a few of the numerous Advantages claimed by the above Self-oiling Wheels:—

- 1.—Two-thirds (at least) less grease or oil is required than at present used by any known method of lubricating Mining Wagons, whether by hand, machine, or otherwise.
- 2.—These wheels effect a very great saving in haulage power; also wear and tear—being so constructed as never to allow the bearings to become dry. The revolving of the wheel leads out the oil as required, and immediately the wagon stops the lubricator ceases its action.
- 3.—No waste of grease can occur, no matter in what position the wagon may be placed, when discharging its contents (even if up side down); and when the wagons are not in use it is utterly impossible for any grease to escape, as it is all stored below the outlet (as shown above).
- 4.—When once these wheels have been charged with liquid grease (which can be done by any inexperienced person) they do not require any attention or re-greasing whatever for several weeks or even months afterwards, in proportion to the distance travelled.
- 5.—These wheels can be readily fixed to any description of either wood or iron curves now in use, whether the wheels are upon the inside or outside of the frame.
- 6.—They are exceedingly simple in construction, have no detail, and are not liable to get out of order.
- 7.—They possess great strength, durability, and extreme lightness, being made of CRUCIBLE STEEL.

Where FAST Wheels and Axles are adopted instead of Loose ones, as shown above, see our Illustrated Sheets of Drawings Nos. 2 and 3 of

Crucible Steel Wheels and Axles, fitted complete by Hadfield's Patent Method, and Hadfield's Self-oiling Pedestals.

MACHINE MOULDED STEEL GEAR WHEELS OF EVERY DESCRIPTION.

JOHN WILLIAMS AND CO., WISHAW, SCOTLAND,

MANUFACTURERS OF ALL KINDS OF

Cut and Lath Nails; Joiners', Moulders', and Flooring Brads; Copper and Zinc Cut Nails; Colliery Plate Nails; Washers, Boiler Plates, Tube Strips, Sheet Iron for Galvanising and other purposes

PRICE LIST ON APPLICATION.

PIERCE S. HAMILTON, PRACTICAL GEOLOGIST, SURVEYOR, AND MINING ENGINEER AND AGENT, OFFERS HIS SERVICES in either of these capacities to those interested or desirous of investing in MINING PROPERTY in the PROVINCE OF NOVA SCOTIA or elsewhere in the DOMINION OF CANADA.

Having for years filled the administrative position of Chief Commissioner of Mines for Nova Scotia, and having both before and afterwards been himself largely engaged in Mining operations, Mr. HAMILTON has had exceptionally good opportunities of informing himself as to the variety, extent, and character of the mineral deposits of that Province, and as to the most economical and effective methods of working them.

ADDRESS—PIERCE S. HAMILTON, HALIFAX, NOVA SCOTIA, DOMINION OF CANADA.

MONEY LENT, at EIGHT, NINE, and TEN PER CENT., on FIRST MORTGAGE of FREEHOLDS for IMPROVEMENTS and STOCKING, said freeholds in the Province of MANITOBA. Address, HENRY C. JONES, Solicitor, 20, Masonic Hall, Toronto.

At the PARIS EXHIBITION the Jurors have Awarded

THE GOLD MEDAL, THE SILVER MEDAL, AND HONOURABLE MENTION
FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

Stones broken equal, and Ores better, than by hand, at one-tenth the cost.

H. R. MARSDEN,
ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE'S

Improved Patent Stone Breakers & Ore Crushers.

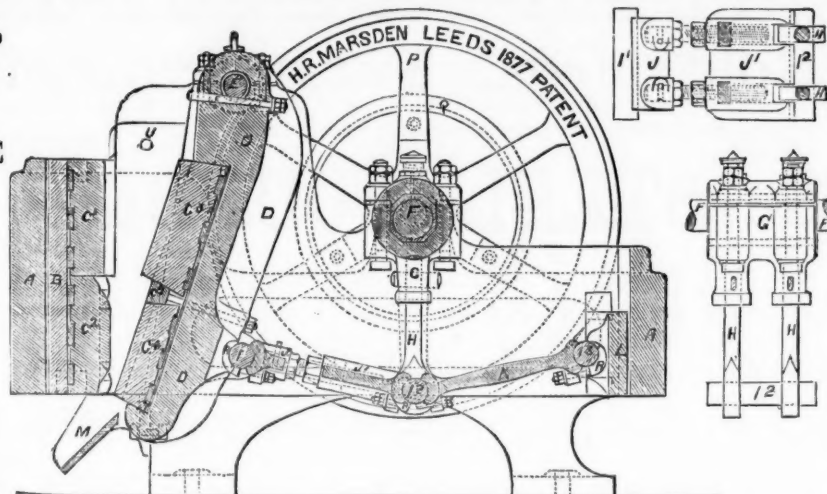
**New Patent Reversible Jaws,
in Sections, with Patent
Faced Backs.**

**NEW PATENT ADJUSTABLE
TOGGLES.
OVER 2500 IN USE.**

**New Patent Draw-back
Motion.**

NEW PATENT STEEL TOGGLE BEARINGS.

**70
PRIZE MEDALS.**



READ THIS—

Wharhole Lime Works, Maryport, Whitehaven,
November 7, 1873.

H. R. MARSDEN, Esq., Soho Foundry, Meadow Lane, Leeds.
DEAR SIR,—The machine I have in use is one of the large
size, 24 in. by 12 in. The quantity we are breaking daily with
this one machine is 250 tons, the jaw being set to break to a
size of 2½ in. We have, however, frequently broken over
300 tons per day of ten hours, and on several occasions over
300 tons during the same period. The stone we break is the
blue mountain limestone, and is used as a flux in the various
ironworks in this district. We have now had this machine in
daily use for over two years without repairs of any kind, and
have never had occasion to complain of any inconvenience in
using the machine. I hope the one you are now making for
me may do its work equally well. The cost—INCLUDING EN-
GINE-POWER, COALS, ENGINEMAN, FEEDING, and all EXPENSES
OF EVERY KIND—is just 3d. per ton. Should any of your
friends feel desirous of seeing one of your machines at work,
I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very truly,

WILLIAM MILLER.

AND THIS—

Wharhole Lime Works, Aspatria, Cumberland,
July 11th, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.
DEAR SIR,—We are in receipt of your letter of 4th inst. I
may just state that the stone breaker above named has been
under my personal superintendence since its erection, and I
have no hesitation in saying that it is as good now as it was
five years ago.

I am, dear Sir, yours faithfully,

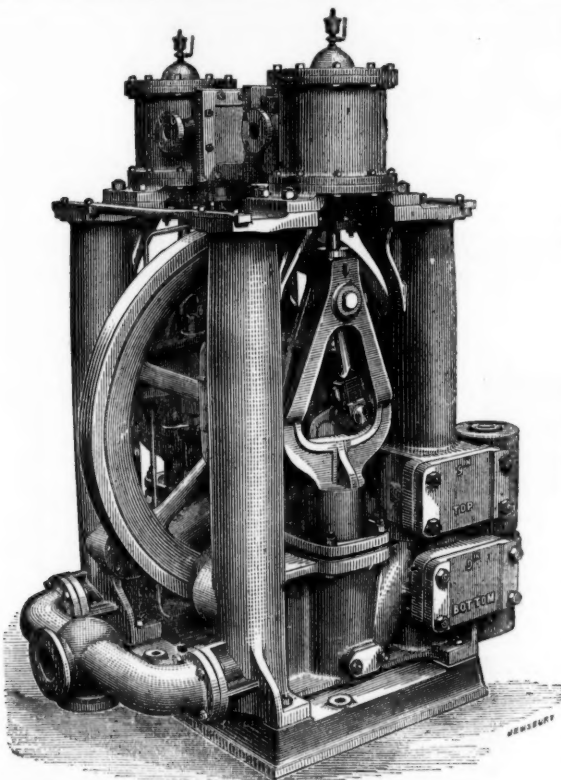
FRANCIS GOULD.

GREATLY REDUCED PRICES ON APPLICATION.

ALL BEARINGS are renewable, and made of H.R.M.'s Patent Compound ANTIFRICTION METAL.

CATALOGUES, TESTIMONIALS, &c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.



STEAM PUMPS for COLLIERY PURPOSES, specially adapted
for Forcing Water any height; also for Sinking; and for Feeding
Boilers.

JOHN CAMERON has made over SIX THOUSAND.

WORKS: OLDFIELD ROAD, SALFORD, MANCHESTER.

SILVER MEDALS AWARDED AT CORNWALL POLYTECHNIC
1872 AND 1876.

**THE WELL-KNOWN PATENT SELF-ACTING ORE
DRESSING MACHINERY,** as in operation at most of the
large Mines in the Kingdom and Abroad, is now supplied solely by
THE PATENTEE AND MANUFACTURER, Mr. GEORGE GREEN,
Mining Engineer, AT GREATLY REDUCED PRICES; also all
descriptions of Mining Machinery, including
GOLD AND SILVER AMALGAMATING MACHINERY, complete.
Stamp Mills, Water Wheels, Steam Engines, &c.

ROLLER SHELLS FOR CRUSHING MILLS—a speciality.

SPECIAL DESIGNS FOR EXPORT AND DIFFICULT TRANSIT.

Prices and particulars on application to the Manufactory,
ABERYSTWITH, SOUTH WALES.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857.

The largest and most widely circulated papers in Monmouthshire and South
Wales. Chief Offices, NEWPORT, Mon.; and at CARDIFF.

The "Evening Telegram" is published Daily, the First Edition at 3 P.M.; the
Second Edition at 5 P.M. On Friday, the "Telegram" is combined with the
"South Wales Weekly Gazette," and Advertisements ordered for not less than
Six Consecutive Insertions will be inserted at a Uniform Charge in both papers.
P.O.O. and Cheques payable to HENRY RUSSELL EVANS, 14, Commercial-street,
Newport, Monmouthshire.

THE NEWCASTLE DAILY CHRONICLE
(ESTABLISHED 1764).

THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER,
Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard-street, North
Shields; 195, High-street, Sunderland.

THE "CHAMPION" ROCK BORER

MINE AND QUARRY STANDS, STEEL DRILLS, SPECIALLY PREPARED INDIARUBBER HOSE, TESTED
IRON PIPES, &c.



Air-Compressing Machinery,

Simple, strong, and giving most excellent results, and

ELECTRIC BLASTING APPARATUS.

**Full particulars of rapid and economical work effected
by this machinery, on application.**

R. H. HARRIS, late

Mechanical and Consulting Engineers,

ULLATHORNE AND CO., 63, QUEEN VICTORIA STREET, LONDON, E.C.

**Electric-Bell Signals for Collieries,
Factories, Warehouses, &c.,**

WITH OR WITHOUT GALVANIC BATTERIES.

NEW SYSTEM—CAN BE RUN AT ANY PART OF THE ROAD. Cheap, safe, and reliable. Efficiency guaranteed. LINES
OF TELEGRAPH erected and maintained. LIGHTNING CONDUCTORS, &c.

For estimates and particulars apply to—

SYDNEY F. WALKER,

LATE G. E. SMITH,

TELEGRAPH ENGINEER

COMMERCIAL BUILDINGS LONG ROW NOTTINGHAM.

GOLD MEDAL AWARDED, PARIS EXHIBITION 1878.

THOMAS TURTON AND SONS,

MANUFACTURERS OF

MINING STEEL of every description.

**CAST STEEL FOR TOOLS. CHISEL. SHEAR, BLISTER, & SPRING STEEL
MINING TOOLS & FILES of superior quality.**

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS.
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

SHEAF WORKS & SPRING WORKS, SHEFFIELD.

LONDON OFFICES.—90 CANNON STREET, E.C. PARIS DEPOT.—12, RUE DES ARCHIVES.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES,
FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS,
RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.
STOURBRIDGE FIRE BRICKS AND CLAY.